

OPERATING MANUAL

MODEL NO. 950 STANDARD  
&  
MODEL NO. 951 LOW PROFILE

2 HP  
230V 1 PHASE  
230V 1 PHASE AC DRIVE  
460V/575V 3 PHASE

GAS FIRED HOT AIR BLOWER

TRACK SWITCH SNOW MELTER

WITH STEEL TIE DUCT

MANUFACTURED

BY

***RECO***

RAILWAY EQUIPMENT COMPANY

525 9<sup>th</sup> STREET SOUTH

DELANO, MINNESOTA 55328

TEL. 763-972-2200

FAX. 763-972-2900

E-Mail:

Technical Support: [Techsupport@rwy.com](mailto:Techsupport@rwy.com)

Sales: [Sales@rwy.com](mailto:Sales@rwy.com)



## Table of Contents

1.	Warnings and Cautions .....	1
2.	General Information .....	5
2.1.	Model Number Description .....	5
2.2.	Standard Features .....	5
3.	Component Description .....	8
3.1.	Main Hot Air Blower (HAB) Unit .....	8
3.2.	Standard Ductwork .....	10
3.3.	Optional Ductwork .....	11
4.	Installation .....	12
4.1.	Tie Duct .....	12
4.2.	Main HAB Unit .....	13
4.3.	Point Nozzles and Track Ducts .....	15
4.4.	Gas Connection .....	16
4.5.	Changing the Gas Orifice .....	20
4.6.	Electrical Connection .....	22
5.	Control Module .....	24
5.1.	Description .....	24
5.2.	Set-Up and Adjustments .....	26
5.3.	Password 0 and 5 Menus .....	27
5.3.1.	Status .....	27
5.3.2.	Factory Defaults .....	28
5.3.3.	Set Points .....	28
5.3.4.	Fault History .....	31
5.4.	Push Buttons and LED Status Indicating Lights .....	33
5.4.1.	Push Buttons .....	33
5.4.2.	Led Status Indicating Lights .....	33
5.5.	Operation .....	35
5.6.	Fault Conditions .....	37
6.	Seasonal Maintenance .....	42
6.1.	Spring .....	42
6.2.	Fall .....	42
7.	Low Pressure Regulator Adjustment/Output Temp Test .....	43
8.	Troubleshooting .....	44

8.1.	Unit Does Not Start .....	44
8.2.	Unit Does Not Maintain Operation .....	44
8.3.	Low Heat Level.....	44
8.4.	Low Airflow .....	45
8.5.	Gas Valve .....	45
8.6.	High Heat Level .....	45
9.	Snow Detector.....	46
9.1.	Snow Detector Installation .....	46
9.2.	Snow Detector Operation .....	47
9.3.	Snow Detector Maintenance .....	47
9.4.	Snow Detector Troubleshooting.....	48
9.4.1.	No Heat on the Sensing Head .....	48
9.4.2.	Does Not Detect Moisture .....	48
9.4.3.	Constant Indication of Moisture Detection.....	48
10.	Specifications.....	49
11.	Drawings .....	50
12.	Limited Warranty.....	51

## 1. Warnings and Cautions



CAUTION

### GENERAL HAZARD WARNING

FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THESE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.

IF YOU NEED ASSISTANCE OR HEATER INFORMATION, SUCH AS INSTRUCTION MANUALS, LABELS, ETC., CONTACT THE MANUFACTURER.



CAUTION

WARNING: FIRE, BURN, INHALATION, AND EXPLOSION HAZARD.

KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS. NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.





CAUTION

NOT INTENDED FOR INDOOR USE. IT IS ONLY INTENDED FOR OUTDOOR USE.

WARNING: NOT FOR HOME OR RECREATIONAL VEHICLE USE.

The heater is designed and approved for use as a construction heater under ANSI Z83.7

We cannot anticipate every use which may be made of our heaters.  
CHECK WITH LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT APPLICATIONS.

Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.

**PLEASE READ THIS INSTRUCTION MANUAL ENTIRELY BEFORE HANDLING THIS MATERIAL OR ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS HOT AIR BLOWER SYSTEM.**

**PLEASE READ THE WARNINGS AND CAUTIONS LISTED BELOW.**



SHEET METAL EDGES MAY BE VERY SHARP AND CAN CAUSE SEVERE CUTS OR LACERATIONS. PROTECTIVE GLOVES AND CLOTHING SHOULD BE WORN. USE CAUTION WHEN HANDLING ALL SHEET METAL COMPONENTS.



THE HOT AIR BLOWER TRACK SWITCH SNOW MELTER SYSTEM CAN BE OPERATED REMOTELY OR BY A SNOW DETECTOR SYSTEM. THEREFORE, OPERATION MAY BEGIN UNEXPECTEDLY. USE CAUTION WHEN IN THE AREA.



SYSTEM OPERATES WITH VARIOUS VOLTAGE LEVELS UP TO 600VAC. CONTACT WITH ELECTRICITY CAN BE HAZARDOUS OR LETHAL. MAKE SURE THAT THE MAIN CIRCUIT BREAKER IS TURNED OFF BEFORE ATTEMPTING TO SERVICE THIS SYSTEM. EVEN WITH CIRCUIT BREAKER OFF LINE VOLTAGE IS PRESENT AT THE TOP CIRCUIT BREAKER CONNECTIONS.



THIS SYSTEM CONTAINS A HIGH SPEED AIR FAN WHICH ROTATES AT UP TO 3600RPM AND CREATES FORCEFUL SUCTION WHEN OPERATING. DO NOT OPERATE THE BLOWER SYSTEM IF ANY OF THE DUCTWORK COMPONENTS HAVE BEEN REMOVED.



THIS SYSTEM OPERATES WITH NATURAL GAS OR PROPANE. BOTH ARE GASES WHICH ARE FLAMMABLE AND EXPLOSIVE. USE EXTREME CAUTION WHEN WORKING IN THE AREA. AVOID ANY OPEN FLAME, SPARKS OR OTHER SOURCE OF IGNITION.



THE OUTLET AIR TEMPERATURE FROM THIS GAS SNOW MELTER SYSTEM SHOULD NOT EXCEED 375°F FROM ANY NOZZLE OR DUCT. **DO NOT OPERATE THIS BLOWER SYSTEM IF THE OUTLET TEMPERATURE EXCEEDS 375°F.** AN ACCURATE THERMOMETER SHOULD BE USED TO REGULARLY CHECK THE OUTLET AIR TEMPERATURE. IF THE OUTLET TEMPERATURE EXCEEDS 375°F, CHECK TO MAKE SURE THAT THE FLOW OF AIR IS NOT RESTRICTED AT ANY POINT, THAT THE BLOWER/MOTOR ARE OPERATING PROPERLY, THAT THE CORRECT ORIFICE IS USED FOR THE TYPE OF FUEL USED, AND THAT THE REGULATOR(S) ARE PROPERLY ADJUSTED FOR THE FUEL BEING USED. CONSULT RAILWAY EQUIPMENT COMPANY IF YOU ARE UNABLE TO OPERATE THIS GAS SNOW MELTER SYSTEM BELOW 375°F.

A HIGH TEMPERATURE LIMIT SYSTEM HAS BEEN INCORPORATED INTO ALL RAILWAY EQUIPMENT COMPANY GAS SNOW MELTER SYSTEMS BEGINNING IN 1999. RAILWAY EQUIPMENT COMPANY ALSO HAS A HIGH TEMPERATURE LIMIT MODIFICATION KIT THAT CAN BE ADDED TO GAS SNOW MELTER SYSTEMS MANUFACTURED PRIOR TO 1999. IT IS RECOMMENDED THAT THIS HIGH TEMPERATURE LIMIT SYSTEM BE INSTALLED AND USED. CONSULT RAILWAY EQUIPMENT TO ORDER THE HIGH TEMPERATURE MODIFICATION KIT, OR IF YOU NEED ASSISTANCE REGARDING THE HIGH TEMPERATURE LIMIT SYSTEM.

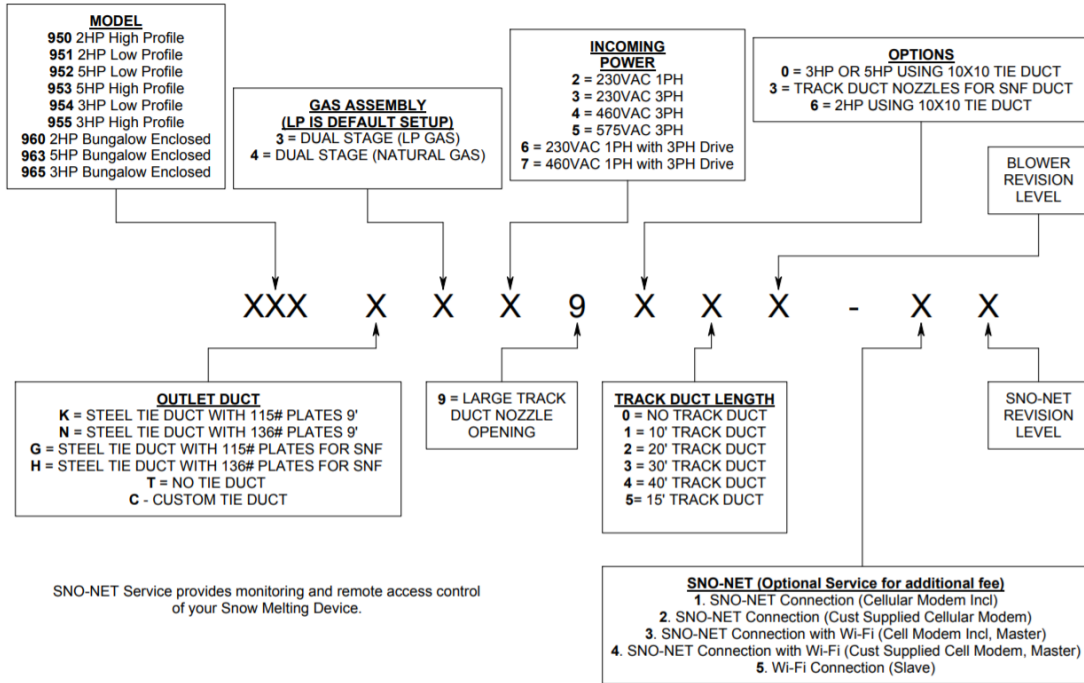
THIS SNOW MELTER SYSTEM HAS BEEN DESIGNED TO PROVIDE DEPENDABLE EFFECTIVE OPERATION IN ALL WEATHER CONDITIONS WITHOUT SWITCH COVERS. SWITCH COVERS MAY CAUSE HIGHER AIR TEMPERATURES. IF SWITCH COVERS ARE USED, YOU MUST DETERMINE A SAFE OPERATING AIR TEMPERATURE AND ADJUST BURNER PARAMETERS ACCORDINGLY. ADJUSTMENT OF BURNER PARAMETERS MAY NEGATIVELY AFFECT BURNER PERFORMANCE AND COMBUSTION CHARACTERISTICS TO THE EXTENT THAT THE BURNER MAY BE UNABLE TO MAINTAIN COMBUSTION. CONSULT RAILWAY EQUIPMENT COMPANY REGARDING BURNER OPERATING PARAMETERS.

TWO (2) COMPLETE INSTRUCTION MANUALS HAVE BEEN INCLUDED WITH THIS SNOW MELTER SYSTEM. PLEASE KEEP ONE OF THE MANUALS WITH THE SYSTEM AFTER INSTALLATION. ANYONE OPERATING OR SERVICING THIS SNOW MELTER SYSTEM SHOULD READ THE MANUAL ENTIRELY BEFORE PROCEEDING.

IF YOU HAVE ANY QUESTIONS CONCERNING THE MANUFACTURE, DESIGN, FUNCTION, INSTALLATION, OPERATION OR MAINTENANCE, CONTACT RAILWAY EQUIPMENT COMPANY BEFORE PROCEEDING.

## 2. General Information

### 2.1. Model Number Description



### 2.2. Standard Features

Here is a list of standard feature that come with the GHAB:

- GHAB complies with AREMA 12.6.10.
- Gas fired operation, allows for both propane and natural gas (convertible in the field).
- Two stage operation that allows savings on fuel costs. Second stage runs at 50% output of the first stage.
- Direct drive motor, totally enclosed fan cooled.
- High efficiency, quiet operation blower.
- Remote operation via contact closure (low voltage, low current) with timed shut off.
- Built-in snow detector system (requires Snow Detector assembly option).
- Auto-Off-Local switch.
- High temperature limit thermostat/shut off.
- Adjustable air temperature control.
- Adjustable rail temperature control.
- Reply indication via GHAB contact closure.
- Fail indication via GHAB contact closure.
- Main circuit breaker.
- Audible tone before blower startup

- Weather tight gasketed control enclosure
- Status indicating lights for all control functions
- Start delay timer for sequential startup
- Run timer for timed operation
- Selectable "Transparent" snow detector operation
- Snow detect timer
- All ductwork and nozzles are thermally and electrically isolated from tracks
- Quick-release track duct
- Blower motor starter with overload protection
- Remote auxiliary gas valve (115VAC) supplied connection
- Gas line accessories:
  - Manual gas valve
  - Gas line strainer
  - Low pressure regulator
  - Flexible gas line connection pipe
- Elevated air intake
- Adjustable delay for start-up (10 sec. -5 min.)
- Complete flame safeguard control:
  - Pre-ignition air purge
  - Air flow proving switch
  - Direct spark ignition
  - Flame proving sensor
  - Post shut off air purge 4 min.
  - Automatic shut off on loss of flame or air flow
  - Leaky gas valve detection
  - Automatic retry on flame loss
  - Automatic reset on flame safeguard control
  - All flame safeguard controls CSA listed
- All components mounted and wired within main unit – no external wiring required except for remote control, indications, optional snow detectors, external gas valve and rail temp sensor.
- Galvanized case constructed of 14-gauge steel, high temperature powder coated finish.
- Convenient panel access to high efficiency burner, flame sensor and spark igniter.
- Galvanized steel adjustable mounting foundations.
- Standard ductwork: flame duct with straight insulated flexible duct and heavy duty insulated offset duct connects to main tie duct

electrically insulated between rails, 24 inch (minimum) switch point  
nozzles.

**The following items are recommended for use with propane gas service:**

Tank "pigtail" with POL/POL fittings (P/N 45038-12" or 60127-36")

High pressure regulator (P/N 45103)

Gas line strainer (P/N 45040)

Remote solenoid valve (P/N 45036) OR

Complete Propane Package (P/N 9458-0100)

### 3. Component Description

#### 3.1. Main Hot Air Blower (HAB) Unit

**a. Main Circuit Breaker**

Provides main over-current protection and manual on-off control of electrical power.

**b. Motor Contactor**

Provides automatic blower motor control, with high current contacts.

**c. Motor Overload Relay**

Protects the blower motor from an over-current condition.

**d. Control Module**

Provides complete control of operation. See separate description and details, section 5.

**e. Control Transformer**

Provides control power for the control module and other control components. The multi-tapped secondary provides 36VAC CT and 17VAC CT. The primary has 115VAC input plus a 230VAC step-up winding and 12.6VAC CT windings.

**f. Ignition Transformer**

Provides 6000VAC to the spark igniter during the ignition sequence.

**g. Airflow Switch**

Located in the flame duct, the pressure switch indicates proper airflow before and during burner operation.

**h. Burner**

Contains the actual flame. Also holds the spark igniter and the flame-sensing rod.

**i. Propane/Natural Gas Orifice Plate**

Controls the rate of flow of gas to the burner.

**j. Spark Igniter**

The spark plug type igniter provides spark for the burner. The spark igniter is momentary - sparks only until the flame has been established.

**k. Flame Detection Rod**

The flame detection rod monitors the flame at the burner nozzle using the rectification principle. This provides a signal to the control module if a proper flame exists.

**l. Air Temperature Sensor**

This is a thermocouple sensor for monitoring the ambient air temperature. The flexible magnetic end of the sensor should be placed so it is shaded by the GHAB unit, generally on the north side.

**m. Rail Temperature Sensor**

This is a thermocouple sensor for monitoring the actual rail temperature.

**n. Gas Valve**

These are electric solenoid valves which control the flow of gas for burner operation. It is controlled directly from the control module.

**o. Blower Motor**

The motor is totally enclosed and fan cooled.

**p. Blower**

The high efficiency blower wheel is dynamically balanced for smooth and quiet operation.

**q. Buzzer**

The buzzer will sound a 10-second tone immediately before the motor contactor is energized.



### 3.2. Standard Ductwork

**DO NOT WALK ON EQUIPMENT. THIS  
INCLUDES TRACK DUCTS AND  
FIBERGLASS COVERS.**

**a. Heat Duct**

The first section of ductwork attached to the main HAB unit. This duct contains the burner, air flow switch, spark igniter and the duct pressure sensor.

**b. Flex Duct**

Connects the heat duct to the offset duct. It is a section of flexible duct, enclosed in an insulated sheet metal wrapper.

**c. Heavy Duty Offset Duct**

Connects the flex duct to the tie outlet duct. This duct provides an 8” offset and encloses the air mixer.

**d. Tie Outlet Duct**

The outlet duct extends under the rails in place of a tie and directs the airflow to the point nozzles and track ducts. The rail attaches to the duct using tie plates and E clips. The tie plates are electrically insulated from the rail using an insulating kit. There are six openings in the top for point nozzles and track duct nozzles. Refer to the drawing page for the duct layout.

**e. Track Ducts**

These ducts rest on brackets on the ties and the outlet duct. They are installed over the track duct nozzles. The track ducts consist of a 5’ point, a 5’ mid, and 10’ sections to complete the desired length.

**f. Track Duct Nozzle**

This attaches to the inner two rectangular openings on the top of the outlet duct. This directs airflow down the length of the switch through the track ducts.

**g. Track Duct Nozzle Isolating Kit**

This is an electrically insulating gasket with insulating washers and hardware to provide isolation between the nozzles and the outlet duct. Refer to drawing 9278-0027 for proper installation.

**h. Quick Change Nozzle Plate**

This plate allows for quick removal or installation of nozzles to the tie duct, by simply loosening of four bolts the nozzle assembly can be removed or installed.

**i. Track Duct Support Bracket**

These brackets are used to secure the track duct in position. Refer to drawing 92774.

**j. Switch Point Nozzle**

These nozzles direct heated air down the switch point. They are mounted on the outlet duct. They can be adjusted for proper airflow direction. Nozzles may be shortened by up to 10” for proper fit.

**k. Point Nozzle Isolating Kit**

This is an electrically insulating gasket with insulating washers and hardware to provide isolation between the nozzles and the outlet duct. Refer to drawing 9278-0021 for proper installation.

**3.3. Optional Ductwork**

**a. Extension Ducts**

Extension ducts of various lengths are available to meet specific requirements. These are insulated and enclosed in a metal wrapper. Make sure the duct is mounted in the correct orientation, as there is an access opening underneath the insulating wrapper cover. If additional duct extensions are required, this assembly can be added between the outlet duct and the offset duct.

**b. 7’ Track Duct**

These track ducts are seven feet long. They are often mounted outside of the track near the switch machine. A kit is available (P/N 9278-0270) that includes a 7’ track duct, a track duct nozzle and a track duct isolation kit.

**NOTE: OTHER DUCTWORK ASSEMBLIES ARE AVAILABLE. CONSULT THE FACTORY FOR SPECIAL DUCTWORK NEEDS.**

## 4. Installation

**DO NOT WALK ON EQUIPMENT. THIS  
INCLUDES TRACK DUCTS AND  
FIBERGLASS COVERS.**

**NOTE:** The installation should be done in this order:

1. Tie Duct Outlet Duct/Offset Duct
2. Main HAB Unit/Flex Duct
3. Point Nozzles and Track Duct
4. Gas
5. Changing the Gas Orifice
6. Electrical

**PLEASE READ THROUGH THE ENTIRE  
INSTRUCTIONS BEFORE BEGINNING THE INSTALLATION**

### 4.1. Tie Duct

1. Remove the appropriate tie. Choose the tie that will result in the point nozzles being as close to the switch point as possible without interfering with normal switch operation. The distance from the center of the tie duct to the end of the point nozzles is 33". If necessary, up to 10" may be cut off each point nozzle.
2. Remove sufficient ballast to provide at least 14" clearance from the bottom of the rails.
3. Carefully slip the tie duct under the rails and position it so that the rails are directly above the tie plates. Ensure that the tie duct is centered between the adjacent ties.
4. Place a rubber pad on the tie plate, then using a suitable lever, raise one end of the tie duct until the rail lies correctly on the pad on the tie plate. Place two e-clip insulators, one on each side of rail, in place and then fasten the rail to the tie plate using two of the four 927248 rail clips. Use a heavy hammer or maul to drive the clips securely into place.
5. While keeping the tie duct supported in place, firmly pack ballast under the tie duct from the rail out to the end.

6. Repeat steps 4 and 5 for the other end of the tie duct.
7.
  - i. Remove the end flange plate nearest the HAB by loosening the six retainer bolts.
  - ii. Install the two-foot heavy duty offset duct (P/N 9278-3402) to the tie duct using hardware and gasket supplied with the offset duct.
8. Firmly repack ballast under the entire tie duct.

#### 4.2. Main HAB Unit

1. The main HAB unit has four slotted mounting holes on 15-1/2" x 34-1/2" centers.
2. Refer to Foundation Assembly drawing for the assembly of the optional mounting foundation.
3. Use the provided GHAB positioning drawings to determine the approximate position and height of the mounting foundation. The top of the foundation should be placed 4"-6" below the height of the ties. This will allow final adjustment of the HAB unit.  
**NOTE:** The drawing shows a standard HAB unit, but can be used for the low profile series, also.
4. Excavate and place the foundation in its proper location.
5. Refer again to the drawing of the Foundation Assembly, detail A, showing the mounting bolt arrangement. Attach four 3/4-10 x 8" hex bolts in the slotted holes of the blower base, using a washer on each side of the blower base and a hex nut.
6. Thread a hex nut about halfway onto each bolt.
7. Place the blower unit on the foundation using a flat washer on the top and bottom of the foundation and another hex nut on the bottom. The slotted holes in the foundation will allow for side-to-side adjustment, and the slotted holes in the HAB base will allow front-to-back adjustment. However, do not tighten the mounting nuts yet.
8. Install the 30" flex duct onto the HAB flame duct.

- 9.** Now adjust the HAB unit side to side, up or down, and forward or backward to obtain the proper alignment of the heat duct to the offset duct. It may be necessary to adjust the position of the offset/outlet duct assembly. The adjustments should be made so that there is no stress on any of the ductwork; also flex duct should measure 30". Again, leave the mounting nuts loose for now.
- 10.** Connect the other end of the flex duct to the HD offset duct.
- 11.** With all components in the proper position, the foundation nuts may now be tightened.
- 12.** The fill can now be replaced around the mounting foundations.
- 13.** Adjustable air intake screens. To start the GHAB in a new location, set the intake screens in the closed position. If there is a moisture problem, where frost builds up on the intake screens, the intake screens can be set in the open position to improve the airflow into the blower.

### 4.3. Point Nozzles and Track Ducts

**NOTE:** Refer to the GHAB positioning drawing for the track duct and point nozzle position. LH and RH Point/Track Nozzle Assemblies:

1. Attach point/track nozzle assembly RH (P/N 9508-4000) and point/track nozzle assembly LH (P/N 9508-4001) to the openings in the tie duct. Position assemblies for proper airflow direction.
2. Assemble the individual track duct sections into two complete track duct sections. The mid and heel sections contain splices wrapped around the outside of the duct. Unhook the clips to remove the three cover pieces. The bottom can now be removed from the duct.

**NOTE:** To assemble the splice:

- i. Center the bottom splice piece on the seam between the two track ducts.
  - ii. Connect the center cover piece over the seam. (**NOTE:** The center cover piece has slots to contain the bolts on the track duct).
  - iii. Finally, connect the two end cover pieces.
3. Lay the track ducts on the rail ties alongside where they will be installed.
4. Refer to the drawing 92774. Place the track duct support brackets in position on the ties so that one is near the heel end and one near each joint. Use the lag bolts to fasten the brackets in place. Lay the track duct on the bracket bases. Place the hold-down straps over the track ducts. Attach the hold-down strap to the track duct support brackets by inserting the spring clip into the strap.
5. Push in the square knockouts in the track ducts where airflow is desired. The knockout should be pushed in and bent completely so that no portion of the knockout obstructs the airflow in the duct. Knockout tabs that are not bent back completely will obstruct the airflow as it moves through the track duct resulting in reduced air pressure and airflow further along the track duct.

#### 4.4. Gas Connection



**CAUTION**

**When tightening gas line fittings or components to the HAB unit, be sure that you do not rotate the pipe that enters the blower unit. This could cause the gas control valve inside the blower unit to rotate also. Please reference the label attached just above the pipe that enters the blower unit.**

**NOTE:** Optional items available from Railway Equipment Co. are denoted by \*

1. The following items are shipped in a carton marked "GAS LINE ACCESSORIES", along with various pipe fittings, so that they may be arranged to fit the particular installation. Refer to Instruction Sheet R9500-0027 included with Gas Line Accessories for the proper placement of these components:
  - Flexible pipe
  - Y strainer (s)
  - Manual shutoff valve
  - Low pressure regulator
  - Regulator Spring, if included
  
2. The following items are available as optional items:
  - \* High Pressure Regulator (P/N 45103)
  - \* 36" Gas tank "pigtail" (P/N 60127)
  - \* 12" Gas tank "pigtail" (P/N 45038)
  - \* Remote gas valve (P/N 45036)

**NOTE:** A propane package is available (P/N 9458-0100) that includes a 36" tank pigtail, high pressure regulator, gas line strainer, gauge, remote solenoid valve in a pole mount enclosure, and a 4X4X8' post.

#### **FOR NATURAL GAS INSTALLATION PROCEED TO STEP 5**

3. \* Install the copper "pigtail" to the propane tank. Each end of the pigtail is a reverse thread.
  
4. \* Install the high pressure (red) regulator to the pigtail. Remember reverse thread on the pigtail connection.
  
5. Install the "Y" strainer downstream (but near) the high pressure regulator, or natural gas source.

6. \* Install the remote gas valve downstream (but near) the "Y" strainer. Electrical connections from the remote gas valve are made to terminal posts TS1-10 (115VAC) and NEUTRAL on the HAB unit. The valve must be mounted with the inlet and outlet horizontal, and the coil upwards.
7. Install adequate size gas pipe from the remote tank location to the main HAB unit. Check with local gas supplier for sizing recommendations.
8. The remaining gas line components are attached to the HAB unit, as shown on the drawing, layout, GHAB Gas Line. Remember to position the regulator vent fitting facing sideways so that moisture will not enter the regulator.
9. If you are having problems adjusting the gas pressure low enough on 2 HP units, the spring in the low pressure regulator must be changed. To change the spring, complete the following steps:
  - i. Try adjusting the low pressure regulator for proper fuel pressure. If it can't be adjusted, follow instructions listed below for changing the regulator spring.
  - ii. Turn power off and close manual gas valve.
  - iii. Remove the plug on top of the regulator.
  - iv. Turn the plug inside the regulator counter-clockwise until it can be removed.
  - v. Replace the red spring with the violet spring provided in the gas accessory kit.
  - vi. Replace the top plug.
  - vii. Go to gas pressure menu to adjust.

**FOR INSTALLATION ABOVE 2000 FOOT ELEVATION:**

- i. Turn the manual gas valve to "ON" position and turn power on.
- ii. Push the "LOCAL" button.
- iii. Place the burner control select in the hi-only position.



- iv. After the 30-second pre-purge period, the unit will ignite. Check the gas pressure display. Adjust the white plug in regulator until the display reads 11” water column for propane or 7” water column for natural gas.  
**NOTE:** Clockwise to increase pressure, counter-clockwise to decrease pressure.
- v. Let the GHAB run for a 10 minute period.
- vi. After the 10 minute period, take temperature readings at both point nozzles.
- vii. Determine the ambient temperature at the location and subtract the ambient temperature from the point nozzle reading. This temperature should not exceed 250°F for optimum efficiency.
- viii. If the temperature is above 250°F, adjust the gas pressure at the low pressure regulator down (1” w.c. at a time) until you reach the desired temperature.
- ix. Replace the top plug.

**FOR INSTALLATION BELOW 2000 FOOT ELEVATION:**

- i. Turn the manual gas valve to “ON” position and turn the power on.
- ii. Push the “LOCAL” button.
- iii. Place the burner control select in the hi-only position.
- iv. After the 30-second pre-purge period, the unit will ignite. Check the gas pressure display. Adjust the white plug in regulator until the display reads 11” water column for propane or 7” water column for natural gas.  
**NOTE:** Clockwise to increase pressure, counter-clockwise to decrease pressure.
- v. Let the GHAB run for a 10 minute period.
- vi. After the 10 minute period, take temperature readings at both point nozzles.

- vii.** Determine the ambient temperature at the location and subtract the ambient temperature from the point nozzle reading. This temperature should not exceed 250°F for optimum efficiency.
- viii.** If the temperature is above 250°F, adjust the gas pressure at the low pressure regulator down (1" w.c. at a time) until you reach the desired temperature.
- ix.** Replace the top plug.

#### 4.5. Changing the Gas Orifice

1. This unit uses an orifice plate instead of individual orifices. The orifice plate contains the orifices for both propane and natural gas for both stages of operation.

#### CAUTION

2. Make sure the main circuit breaker is in the OFF position and the manual gas valve is closed before working on the HAB unit.
3. Remove the bottom intake cover from the HAB unit.
4. On the right hand side of the gas assembly you will see the orifice plate. The orifice plate has a tab facing out that says NG for natural gas or LP for propane. This will tell you how the unit is currently set up.
5. To change from one fuel to the other:
  - i. There are four bolts on each gas coupling plate. You need to fully remove the top two bolts on each coupling plate and you need to back out the bottom two bolts on each coupling plate 1/2 to 3/4 of an inch.
  - ii. On the inlet (left hand side of the gas assembly) you need to remove the two bolts securing the gas valve assembly to the outside of the GHAB, and loosen the U-bolt.
  - iii. You can now carefully slide the gas assembly to the left to free the orifice plate.
  - iv. The orifice plate can be pulled away from the outlet manifold and then up and out.  
**NOTE:** Take care removing the orifice plate so you don't damage the O-rings.
  - v. The orifice plate can now be flipped over for the other fuel and re-inserted in between the gas coupling and outlet manifold.  
**NOTE:** Take care replacing the orifice plate so you don't damage the O-rings.
  - vi. Slide the gas assembly back to the right and insert the top bolts on the coupling plates.

- vii.** Verify the tab facing out on the orifice plate is now the correct fuel.
  - viii.** Evenly tighten the eight bolts on the coupling plates.
  - ix.** Replace the bolts on the inlet bracket (outside of GHAB), and tighten the U-bolt hardware.
  - x.** Re-install the lower intake cover.
- 6.** Turn on power and manual gas valve.
- 7.** Test unit and check regulator adjustment and output temp.

#### 4.6. Electrical Connection

##### a. Knockouts

There are knockouts on the side and bottom of the control enclosure for incoming electrical wires.

##### b. Incoming Power

The incoming power should be connected directly to the main circuit breaker.

#### **SPECIAL NOTE FOR 3 PHASE UNITS ONLY**

**WHEN THE MAIN HOT AIR BLOWER UNIT IS STARTED FOR THE FIRST TIME, VERIFY THAT THE MOTOR IS TURNING IN THE CORRECT DIRECTION. TO DO THIS, REMOVE THE BOTTOM AIR INTAKE COVER AND CHECK TO SEE IF THE FAN IS ROTATING IN THE CCW DIRECTION. THERE WILL BE AN ARROW SHOWING THE CORRECT ROTATION DIRECTION. IF THE FAN IS NOT ROTATING IN THE CORRECT DIRECTION, SWAP 2 OF THE INPUT WIRES.**

##### c. Ground

The chassis ground TS1-G should be tied directly to earth ground.



**CAUTION**

**THE 230 / 480 / 575 VAC SUPPLY LINES SHOULD BE SIZED TO ALLOW FOR THE AC MOTOR START-UP CURRENT. REFER TO THE SPECIFICATIONS PAGE FOR START-UP CURRENT. UNDERSIZED CONDUCTORS OR LONG WIRE RUNS COULD DAMAGE THE MOTOR.**

**SPECIAL NOTE: THE CONTROL CHASSIS AND THE REST OF THE MAIN HAB UNIT MUST BE CONNECTED TO GROUND. THE RUBBER PAD BETWEEN THE RAIL AND TIE PLATE ALONG WITH THE E-CLIP INSULATORS WILL INSULATE THE MAIN UNIT FROM THE TRACKS.**

##### d. Control Input

Remote operator control can be provided by a circuit closure applied between terminal posts TS1-1 and TS1-2.

##### e. Indication

Reply indication can be done two ways:

- i. Dry contact closure: Terminal posts TS1-3 and TS1-4 will provide a dry contact closure for indication when the unit is operating under remote control.

- ii. +24 VDC: Place a jumper between terminal posts TS1-2 and TS1-4. +24 VDC indication is now present on post TS1-3 with common at terminal post TS1-6.

**f. Fail**

Reply fail can be done two ways:

- i. Dry contact closure: Terminal posts TS1-5 and TS1-4 will provide a dry contact closure for fail when the unit is in a fault mode.
- ii. +24 VDC: Place a jumper between terminal posts TS1-2 and TS1-4. +24 VDC fail is now present on post TS1-5 with common at terminal post TS1-6.

**g. Duct Work High Temperature Sensor (P/N 9338-0355)**

- i. On the tie duct, remove the two bolts holding down the overtemp sensor cover. Install the sensor onto the duct using the two bolts that were removed.
- ii. Run conduit along duct work back to HAB enclosure; connect connector to enclosure knock out; tighten (**NOTE**: Cut conduit to length if needed).
- iii. Run wires from sensor into enclosure and plug connectors into OVERTEMP (RED) J10 and OVERTEMP (BROWN) J36 located on the control module.
- iv. Use two clamps (P/N 60086) to secure conduit to the side of duct work using existing screws.

<p><b>CAUTION</b> <b>DO NOT INSTALL OVERTEMP SENSOR ON</b> <b>FLEX DUCT.</b></p>
--

**h. Rail Temp Sensor (P/N 9508-0415)**

- i. Attach the sensor to the bottom of the stock rail in front of the point nozzle. Attach conduit to ties using the provided clamps.
- ii. Run wires from sensor into enclosure and plug connector into THERMOCOUPLE CONNECTIONS RAIL TEMP (YELLOW) located on the control module.

## 5. Control Module

### 5.1. Description

The hot air blower control module contains all of the elements and functions necessary for advanced snow melter operation. The unique dual-chip microcomputer has been programmed with logic and timing sequences to provide complete heater control as well as operational control and system interface. Some of the many features included in the control module are:

- Auto-Off-Local selector switch
- Adjustable air temperature setting
- Built-in snow detector (Requires Optional Snow Detector Head)
- Adjustable start-up delay sequence
- Adjustable run timer for timed or continuous operation
- Adjustable snow detect timer for use with optional snow detector
- Operator control and indication
- Remote fault reset
- Audible tone before blower start-up
- Input/output status indication lights:

#### Inputs:

- Air temperature
- Remote Control
- Moisture Detector One or two snow detector(s) (Optional)
- Airflow switch
- Flame Sensor

#### Outputs:

- Blower motor
- Ignition
- Hi Gas valve
- Low Gas valve
- Indication
- Fail



Flame safety control:

10 second tone before blower turn on

Air flow proving

30 second pre-purge before ignition

Direct spark ignition

10 second maximum ignition period before lock-out

Rectification type flame rod sensor

Automatic retry on flame loss

4 minute post-purge period after gas valve turn-off

Automatic reset

Fault if flame does not go out after gas valve is commanded off



## 5.2. Set-Up and Adjustments

To change settings and adjust times do the following:

### **Right Arrow Button**

Pushing the right arrow button will cycle forward through the menus. Each time you press the right arrow button you will advance one menu selection.

### **Left Arrow Button**

Pushing the left arrow button will cycle back through the menus. Each time you press the left arrow button you will move back one menu selection.

### **Up Arrow Button**

The up arrow button allows you to increase values and switch through menu categories.

**NOTE:** Values will be saved.

### **Down Arrow Button**

The down arrow button allows you to decrease the values and switch through menu categories.

**NOTE:** Values will be saved.

**NOTE:** After you are have finished changing the settings / values and you do not touch any of the buttons for 15 seconds, you will see the following screen. This screen just lets you know that your current settings and values are being saved.



### 5.3. Password 0 and 5 Menus

**NOTE:** The following items listed below are for password 5. Password 0 has the same set of menu categories but does not have all the same menu selections in each category. It will be denoted which menu selections you can only see with password 5

The controller has 4 menu categories, they are:

1. Status
2. Factory Defaults
3. Set Points
4. Faults History

#### 5.3.1. Status

##### a. Outside Temp and Preset Value

Displays the current ambient temperature and temperature preset value. If the ambient temperature is below the preset value, the unit will start if requested.

##### b. Gas Pressure and Duct Pressure

Gas pressure is the actual differential pressure at the burner. The unit of measure is inches of water ("H<sub>2</sub>O). To view gas pressure, the burner should be burning. The correct setting should be approximately 11"H<sub>2</sub>O for propane and 7"H<sub>2</sub>O for natural gas. While adjusting, the burner should be in high only. Adjust regulator to change gas pressure value. Duct temperature is the actual duct temperature in degrees F or C.

##### c. Rail Temp and Duct Temp

Rail temperature is the actual rail temperature in degrees F or C. Duct temperature is the actual duct temperature in degrees F or C.

##### d. Total Gas and Reset Gas

(Password 5)

Total gas displays the calculated amount of gas that has been used. The unit of measure is gallons if propane is selected. The unit of measure is cubic feet if natural gas is selected. Reset gas is the same as total gas except it can be reset. To reset, press the down button.

##### e. Hours Meter and Reset Hour

(Password 5)

Hour meter displays the total hours that GHAB has been running. Reset hour is the same as hour meter except it can be reset. To reset, press the down button.

**f. Tank Level, Bat and Temp**

Tank level displays the actual level of propane tank in percent full (optional tank level monitor must be installed). Bat displays the battery level of the tank monitor. Temp displays the temperature in the battery monitor.

**g. Name**

(Password 5)

This screen tells the name you have entered for the unit.

**5.3.2. Factory Defaults**

Factory default is used to place all parameters back to factory default settings. To restore to factory default, select FACTORY DEFAULTS in the menu selection. Press the right arrow button to display “FOR FACTORY DEFAULTS PRESS DOWN BUTTON,” then press the down arrow button to restore factory defaults.

**5.3.3. Set Points**

**a. Password**

A password is needed to access the advanced menus. To enter in the password, use the up or down arrow buttons. Password 5 allows advanced menu items to be changed.

**b. Select Temperature Setpoint**

The ambient temperature below which the unit will energize is set on this screen. When the outside temperature is below this setpoint, the unit will be allowed to operate if requested. The factory default is 38°F (3°C). The range is from 0°F to 100°F (-18°C to 38°C).

**c. Select Run Timer Value**

The run timer can be set from 0 to 1000 minutes. If zero is selected, the outputs will operate continuously, until control on is disabled. If another value is selected, the unit will run until the run timer counts down to zero, after which the unit will shut down and drop indication. The unit can be restarted by removing the contact closure between TB2-1 and 2, then reinstalling it. If Run Timer Pulse Mode is activated, the minimum run time value is 10 minutes. The factory default setpoint is 60 minutes.

**d. Select Snow Timer Value**

The snow timer can be set from 10 to 1000 minutes. The snow time starts counting down when the moisture detector no longer sees snow. The factory default setpoint is 60 minutes.

**e. Select Snow Sensor Speed**

Snow sense speed sets the delay time after the moisture detector sees moisture and starts the snow cycle. The delay time can be set from 1 to 60 seconds. The moisture sensor must see moisture for entire time to start cycle.

**f. Select Snow Indication**

(Password 5)

The choices are OFF or ON. With snow indication off, indication will remain off during snow time if no faults are present. With snow indication on, indication will remain on during snow time if no faults are present.

**g. Select Fault Indication**

(Password 5)

The choices are OFF or ON. With fault indication off, indication will remain off if faults are present. With fault indication on, indication will remain on if faults are present.

**h. Select Start Delay Value**

(Password 5)

The start delay timer can be set from 0 to 250 seconds in 10 second increments. It is used to delay the start of GHAB so when several blowers are at the same location they do not start at same time.

**i. Select Burner Operation**

The choices are LOW, HIGH, AUTO, and AUTO OFF:

- LOW - 50% BTU output of Hi with or without the rail sensor.
- HIGH - 100% BTU output with or without rail sensor.
- AUTO - Switches between high and low dependent on the rail & duct temperature sensor and setpoint.

**NOTE:** If no rail sensor is connected, it will run at low (50% output). Units with only single stage installed, should select high only.

- AUTO OFF - When rail temperature reaches the rail temp setpoint, the GHAB will shut down. When the rail temperature lowers to the ambient temperature setpoint, the GHAB will start again.

**j. Operation Mode**

(Password 5)

The choices are NATURAL, PROPANE, COLD AIR, COLD AIR/PROPANE, and COLD NATURAL:

- NATURAL - The GHAB's burner is fueled by natural gas.
- PROPANE - The GHAB's burner is fueled by propane.
- COLD AIR - The GHAB will turn its blower on with air temperature. It will not use a burner.
- COLD AIR/PROPANE - The GHAB will turn its blower on with air temperature. It will then turn its propane burner on with moisture or control.
- COLD AIR/NATURAL - The GHAB will turn its blower on with air temperature. It will then turn its natural gas burner on with moisture or control.

**k. Select Motor Size**

The choices are:

2 HP 230V 1PH, 3 HP 230V 1PH, 5 HP 230V 1PH,  
2 HP 460V 3PH, 3 HP 460V 3PH, 5 HP 460V 3PH,  
2 HP 575V 3PH, 3 HP 575V 3PH, 5 HP 575V 3PH,  
2 HP 3PH Drive, 3 HP 3PH Drive, 5 HP 3PH Drive  
2 HP 230V 3PH, 3 HP 230V 3PH, 5 HP 230V 3PH

**l. Rail Temp Setpoint**

This can be set from 0°F to 280°F (-18°C to 138°C).

**m. Duct Temp Setpoint**

This can be set from 150°F to 250°F (66°C to 121°C).

**n. Local With/Without Air Temperature**

(Password 5)

Sets the local feature to, or not to, be dependent on the air temperature.

**o. Remote With/Without Air Temperature**

(Password 5)

Sets the remote feature to, or not to, be dependent on the air temperature.

**p. Auto Overtemp Reset**

(Password 5)

Auto overtemp reset will reset the overtemp once it has been triggered.

**q. Select F or C**

(Password 5)

Sets the temperature scale to either Fahrenheit or Celsius.

**r. My IP Address**

This is the IP address for your GHAB unit.

**s. Machine S/N**

(Password 5)

Machine serial # is the serial number of the whole GHAB unit.

**t. Program Rev and Date**

(Password 5)

Shows the program revision and the date it was compiled.

**5.3.4. Fault History**

**NOTE:** Some faults may not show in Fault History until there is an actual fault. Press the up or down arrow button to reset fault count.

**a. Flame Loss and Flame On**

Flame loss counter is total count of flame loss faults. Flame on counter is total count of flame on faults.

**b. Sail Loss and Sail On**

Sail loss counter is total count of sail loss faults. Sail on counter is total count of sail on faults.

**c. Motor Current and Comm Reset**

Motor current fault is total count of motor current faults. Comm reset fault is total count of communication reset faults.

**d. Motor V Fault and Overload**

Motor volts low or high counter. Overloads counter is total motor overloads faults.

**e. Gas Valve Leak and Pressure Fault**

Gas valve counter is total count of leaking gas valve faults. Gas pressure low or high counter.

**f. Duct Pressure Fault and Vap. Press Low**

Duct pressure fault counter is total count of duct pressure faults. Vaporization low fault counter is total count of vaporization low faults.

**g. Gas Level**

Informs if the gas level is low or high.

**h. Over Temp Warning Counter**

Counts the total number of Over Temp warnings.

**i. Auto Overtemp Reset Counter**

Counts the total number of times the Over Temp was reset.

**j. Power Up Counter**

(Password 5)

Counts the number of times the module has been powered up.

**k. Status Log**

Shows the status log history.

## **5.4. Push Buttons and LED Status Indicating Lights**

### **5.4.1. Push Buttons**

#### **a. Auto**

This position will allow operation by placing a circuit closure across terminal posts 1 and 2. It will also allow operation by an optional snow detector.

#### **b. Off**

If off, GHAB cannot be run from remote or snow detector.

#### **c. Local**

If LOCAL without air temp parameter is enabled, pushing the LOCAL button enables the snow melter regardless of outside air temperature. The snow melter will remain on until LOCAL is turned off. This is useful for hot weather testing.

### **5.4.2. Led Status Indicating Lights**

#### **a. Air Temperature**

On when the ambient air temperature is below set point.

#### **b. Moisture Detector**

On when the optional snow detector sensing head(s) senses moisture.

#### **c. Remote Control**

On when there is a circuit closure across terminal posts 1 and 2.

#### **d. Blower**

On when the controller has turned on the output to the blower motor contactor.

#### **e. Air Flow**

On when the sail switch in the air stream is sensing adequate airflow.

#### **f. Ignition**

On when the controller has enabled the output to the ignition transformer.

#### **g. Hi Gas Valve On**

On when the controller has enabled the output to the high gas valve.

#### **h. Low Gas Valve On**

On when the controller has enabled the output to the low gas valve.



**i. Flame Sensor**

On when the flame sensing determines that there is proper combustion.

**j. Indication**

On when there is a circuit closure across terminal posts 1 and 2 and the unit is operating, or the air temperature is above the set point. Also may be on when there is a fault condition under snow detector.

**k. Fail**

This LED is on whenever a fault is present.

## 5.5. Operation

With AUTO selected, the unit can be activated by applying a circuit closure between terminals TS1-1 and 2. If the outside temperature is above set point, the unit will not start a snow melt sequence, but will turn on the indication LED. It will provide a relay contact closure between TS1-3 and 4 to indicate to the remote station that the unit is operational. If the “REMOTE WITHOUT AIR TEMP” parameter is set, the temperature sensor will be overridden, and a contact closure will start a snow melt sequence even if the air temperature is above the set point.

If a circuit closure exists between TS1-1 and 2, and the air temperature is below set point, the unit will begin a snow melt sequence. The unit executes a 0 to 300 seconds time delay depending on the setting of the START DELAY TIMER. Then, a 10 second audible tone sounds as a warning that the blower motor is about to turn on.

The airflow switch is checked to see if it is closed. If it is, the blower will display SAIL SWITCH ON FAULT.

If the airflow switch is open, the motor will turn on. After the blower motor is turned on, the airflow switch is monitored. It closes if airflow is normal. If it does not close within 10 seconds (or 30 seconds for an AC drive) after blower turn-on, the blower displays SAIL SWITCH OFF FAULT. When the airflow switch closes, a 30 seconds pre-purge time will start. After the pre-purge time is completed the gas valve opens, the ignition turns on and the burner is monitored for a normal flame condition. If a flame is not detected within 10 seconds, the gas valve is closed, the ignition spark is removed and the blower displays NO FLAME DETECTED FAULT.

If a normal flame condition is detected the “indication” contact closure is established between TS1-3 and 4. The unit will run for a period of time determined by the setting of the RUN TIMER. If the run timer is set at “0” the unit will continue to run until the circuit closure between TS1-1 and 2 is removed.

If the blower is equipped with the two stage gas valve option and the rail temp sensor is installed, then under normal operation when the rail reaches the preset temperature setting, the low gas valve will open and the high gas valve will close. This will result in a fuel reduction of 50%. When the rail falls below the programmed temperature, the high gas valve will open and the low gas valve will close resulting in the burner returning to 100% capacity.

If the blower is equipped with the two stage gas valve option and the duct temp sensor is installed, then under normal operation when the duct reaches the preset duct temperature setting, the low gas valve will open and the high gas valve will close. This will result in a

fuel reduction of 50%. When the duct falls below the programmed temperature, the high gas valve will open and the low gas valve will close resulting in the burner returning to 100% capacity. If the duct temp sensor sees a temperature above 325°F (163°C) both gas valves will be disabled. This prevents over temps.

There is a burner control adjustment available in the control module adjustments that allow the burner to be set to high only, low only or automatic controlled by the rail temp sensor. If the two-stage option is not installed, the burner control switch should be set to high only. Refer to section 5.3.3 Burner Operation.

**SNOW DETECTOR OPERATION:** If the unit is operating with one or two optional snow detector assemblies and moisture is detected by either (or both), a snow melt sequence will begin, provided that the air temperature is below the set point. The unit will start as described in section 5.3.3 Select Snow Timer.

## 5.6. Fault Conditions

### a. Sail Switch On Fault

During startup the processor checks the status of the airflow switch. If the airflow switch is closed or shorted the blower motor will turn on and the blower will run a 4-minute purge to try to clear the airflow switch. The motor will then shut off and sit idle for 1 minute. Upon completion of this 5-minute cycle, the blower will once again check the airflow switch for proper operation. If the airflow switch still shows that it is closed, it will run the 5-minute loop again. This will repeat until fault is cleared or blower is no longer called for.

### b. Sail Switch Off Fault

Sail switch off fault is set when blower is running and air flow switch is open. After the fault is set the blower motor will run a 4-minute purge to try to clear the airflow switch. The motor will then shut off and sit idle for 1 minute. Upon completion of this 5-minute cycle, the blower will once again check the airflow switch for proper operation. If the airflow switch still shows that it is open it will run the 5-minute loop again. This will repeat until fault is cleared or blower is no longer called for. Check to see if the sail switch is free to move and if there are any obstructions in duct work.

### c. No Flame Detected Fault

No flame detected fault is set when blower is running and air flow switch is closed with gas valve open. If no flame is detected within 10 seconds the fault will be set. After the fault is set the blower motor will run a 4-minute purge to try to clear the flame rod. The motor will then shut off and sit idle for 1 minute. Upon completion of this 5-minute cycle, the blower will once again check the flame rod for proper operation. If no flame is present it will run the 5-minute loop again. This will repeat until fault is cleared or blower is no longer called for. Check to see if the flame rod is shorted to ground, the flame rod is loose, the flame rod is dirty or if the insulators is fully installed so that no moisture can short out the flame rod.

### d. Flame Detected On Fault Gas Valve Failure

Flame detected on fault is set when blower is running and air flow switch is closed with gas valve closed. If flame is detected before gas valve is opened the fault will be set. The blower will continue to run and the buzzer fail indication will be set. The circuit breaker must be power cycled to clear this fault. Check to see if the flame rod is shorted to ground, the flame rod is loose, the flame rod is dirty or if the insulators is fully installed so that no moisture can short out the flame rod.

**e. Gas Valve Failure**

During the blower shutdown operation if the unit senses flame after the post-purge, the unit will not shutdown. Instead it will go into gas valve failure mode. In this mode the blower continues to run, the reply will also indicate a problem, and the buzzer will sound. The unit will lock out all other operations and will not be able to be reset except at the unit itself.

**f. Check Fuse #1 24 VDC Power**

Fuse #1 is tripped. Check the following circuits:

- Overtemp switch and wiring.
- Check TS1-2 +24 control on wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**g. Check Fuse #2 Ignition Transformer**

Fuse #2 is tripped. Check the following circuits:

- Ignition transformer and wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**h. Check Fuse #3 Gas Valve / Sail Switch**

Fuse # 3 is tripped. Check the following circuits:

- Check sail switch and wiring.
- Check hi and low gas valve and wiring.
- Check external gas valve and wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**i. Check Fuse #4 Blower Motor**

Fuse #4 is tripped. Check the following circuits:

- Check blower motor contactor and wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**j. Check Fuse #6 Snow Head #1**

Fuse #6 is tripped. Check the following circuits:

- Check snow detector head #1 and wiring.
- Check gas pressure sensor and wiring.
- Check duct pressure sensor and wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**k. Check Fuse #7 Snow Head #2**

Fuse #7 is tripped. Check the following circuits:

- Check snow detector head # 2 and wiring.
- Check sail switch and wiring.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**l. Check Fuse #10 Pressure/Bat Charger**

Fuse #10 is tripped. Check the following circuits:

- Check pressure sensor.
- Check 24V supply for battery backup.
- After problem is corrected, leave power off for 30 seconds and fuse will reset.

**m. Overtemp Fix Problem Press Decrease**

Overtemp sensor has tripped. If the temperature inside the Tie duct exceeds 375°F, it will cause the ductwork overtemp circuit to trip, shutting down the HAB system. Only pushing the down arrow button will reset the unit, giving opportunity to check the cause of the overtemp condition.

**n. Overtemp Fix Problem Press Decrease \_\_\_ Min**

The overtemp sensor has tripped. The HAB system will shut down for some time period then it will reset the unit.

**NOTE:** AUTO OVERTEMP RESET must be enable in order to see this fault.

**o. Overtemp Warning Restart In \_\_\_ Sec**

If the temperature is close to overtemp value, the unit will restart in a certain time period.

**p. Overtemp Missing Install Overtemp**

Caused by missing overtemp sensor.

**q. Motor Voltage Low**

Motor voltage low is caused by inadequate electrical service supply. During motor start up if motor voltage drops below 190VAC, the motor will eventually be damaged. If this under-voltage occurs, an error will be set. Press the down arrow button to clear the fault.

**r. Motor Voltage High**

Motor voltage high is caused by high motor voltage. It can also be caused by high voltage from the electric company.

**s. Motor Overload, Reset Overload Device**

High motor current will trip the motor overload on the control panel. This device is connected to the bottom of the motor contactor on the control panel. Reset by pressing the red button on the device. Check unit for high motor current, bad bearings, or obstructions in the blower wheel.

**t. Motor Current Low**

Caused by low motor current.

**u. Motor Current High**

Motor current high is caused when sensed current is 3 amps over motor name plate for 20 seconds. Check motor for high current, bad bearings, obstruction in blower wheel.

**v. Gas Pressure Low**

Gas pressure low is caused by supply gas pressure during operation dropping to a low level. Check gas delivery system.

**w. Gas Pressure High**

Gas pressure high is caused by high gas pressure going to the burner. Check gas delivery system. Adjust the regulator on the gas delivery system to lower the gas pressure.

**x. Duct Pressure Low**

Duct pressure low is caused by not enough duct back pressure. Possible causes are missing flame cover or missing duct work.

**y. Duct Pressure High**

Duct pressure high is caused by too much duct back pressure. Possible causes are duct work obstructions.

**z. Propane Tank Low Warning Fill Tank**

Propane tank low is caused by low propane tank level.

**NOTE:** Propane tank level monitor must be installed and setup, for this warning to appear.

**aa. Tank Vaporization Pressure Low Warning**

Tank vaporization pressure low warning is caused by low tank temperatures.

**bb. Utility Power Lost**

Utility power lost is caused by no incoming AC voltage. There must be a battery backup in order to receive this fault.

**cc. Additional Fuses**

The control module has 4 additional fuses on the module that require replacement if they are open.

- **FUSE 5** (P/N 51179) FUSE, MINI 5 AMP is above the display and fuses the indication common on terminal 4.
- **FUSE 8** (P/N 51225) MDA 10 AMP is to the right of the display and fuses the 120VAC power to the module.
- **FUSE 9** (P/N 51209) FUSE, .5 AMP, is below the display and fuses the pressure sensors.
- **FUSE 11** (P/N 51179) FUSE, MINI 5AMP is in the top left corner of the control module. This fuse is in the 24VDC control on circuit.

**NOTE:** Remove the module cover to access F5, F8 and F9. F11 is visible with the cover installed.



## 6. Seasonal Maintenance

To perform seasonal maintenance on your GHAB units, please follow the steps below, depending on which season you are in.

### 6.1. Spring

1. Turn off gas source.
2. Turn off electric power at source.
3. Disconnect and remove the control module. Store in a clean, dry place.
4. Turn off manual gas valve.

### 6.2. Fall

1. Check all ductwork for clear airflow. Ensure that the point and track duct nozzle screens are not damaged and are completely covering the openings. Make sure that no debris or rodents have obstructed any area of the ductwork.
2. Inspect the track duct nozzles for proper operation.
3. Remove the flame duct cover. Check the burner. Make sure the spark igniter plug and flame rods are in good, clean condition. Check the wiring to make sure rodent or vibration have not damaged the insulation.
4. Check the airflow sail switch to make sure it is operating properly.
5. Replace the flame duct cover.
6. Install the control module and connect the wires.
7. Turn on the gas source.
8. Turn on the manual gas valve.
9. Turn on the electric power at source.
10. Perform the gas pressure regulator adjustment procedure as described on the following page of this manual.
11. Perform a flame failure test:
  - a. Push the LOCAL button.
  - b. Turn off the manual gas valve.
  - c. Turn on the main circuit breaker.
  - d. After 40 seconds (plus any start delay period) the fault message NO FLAME DETECTED FAULT should be displayed. If the fault does not appear, the control module is faulty and should be replaced.
12. Check the air temperature for proper setting.

## 7. Low Pressure Regulator Adjustment/Output Temp Test

1. Push the LOCAL button.
2. Turn the manual gas valve to “ON” position and turn power on.
3. Place the burner control in the hi-only position. See section 5.3.3 Burner Operation.
4. After the 30-second pre-purge period, the unit will ignite. Check the gas pressure value by removing the regulator top plug. Adjust the regulator until the gauge reads 11” water column for propane or 7” water column for natural gas.  
**NOTE:** Clockwise to increase pressure, counter-clockwise to decrease pressure.
5. Let the GHAB run for a 10 minute period
6. After the 10 minute period, take temperature readings at both point nozzles.
7. Determine the ambient temperature at the location and subtract the ambient temperature from the point nozzle reading. This temperature should not exceed 250°F for optimum efficiency.
8. If the temperature is above 250°F, adjust the gas pressure at the low pressure regulator down (1” w.c. at a time) until you reach the desired temperature.
9. Replace the top plug.
10. Return all switches to their normal operating position.

## 8. Troubleshooting

### 8.1. Unit Does Not Start

1. Check circuit breaker.
2. Check control fuse 11.
3. Check for 18VAC between the following points:
  - a. TS1-6 and TS1-7
  - b. TS1-6 and TS1-8
  - c. Change T1 control transformer if either measurement is incorrect.
4. Check for air temperature below set point.
5. Is the control module programmed for a start-up delay?
6. Monitor the fault display on the control module.
7. Turn the circuit breaker off, and then reset the motor overload relay. The motor overload relay is adjustable. It should be set for the motor name plate current.

### 8.2. Unit Does Not Maintain Operation

1. Check the fuel supply. Refer to section 7, step#4.
2. Check 230VAC and 115VAC from either leg to the center tap neutral (with the unit running). It must be within +10% to -10%.
3. Check the burner. The burner must be clean and free of carbon.
4. The flame rod should be clean and secure.
5. Check the wire from the flame rod to the control module for continuity. Pull the white plug connector on the lower right side of the control module. Use an Ohmmeter to measure continuity from the terminal of the flame rod to the white connector. The reading should be less than 50 KOhms.

### 8.3. Low Heat Level

1. Perform a regulator adjustment/output temp test refer to section 7.
2. Check the fuel supply.
3. Make sure the burner is clean.
4. Make sure the orifice plate is installed for the fuel being used.
5. Check the low pressure regulator.
6. Check to see if the burner control is on low only or if it is in auto and the Rail Temp Sensor setting is forcing it to low output.

#### 8.4. Low Airflow

1. Check for obstructions in all ductwork and the air intake.
2. If there is frost buildup on the air intake screen, move the screen to the “open” position.
3. Check the voltage and current levels on the blower motor.
4. Make sure knockouts on the track duct are pushed all the way back in the track duct.
5. Check the spacing between the inlet cone and the blower wheel. The gap should be less than 1/16 of an inch.
6. Perform pressure switch adjustment.
7. Make sure the blower wheel is turning in the right direction.

#### 8.5. Gas Valve



**CAUTION**

**CHECK THE AREA TO BE SURE THERE ARE NO  
LINGERING GAS FUMES BEFORE DOING  
ANYTHING WHICH MAY CAUSE A SPARK!**

1. Turn off gas to the blower.
2. Turn off power to the blower.
3. Check the gas valve for obstructions.
4. Check the gas valve for proper operation.

#### 8.6. High Heat Level

1. Check for proper orifice installation.
2. Perform the low pressure regulator and Temp Test found in section 7.

## 9. Snow Detector

### 9.1. Snow Detector Installation

1. The snow detector sensing circuitry is contained within the control module. All that is required for snow detector operation is to connect the sensing head(s).
2. Either one or two sensing heads may be used.
3. Each sensing head has three lead wires; black, white, and green. Connect as follows:
  - a. Green: one or both connected to TS1-6
  - b. Black #1: connected to TS1-7
  - c. Black #2: connected to TS1-8
  - d. White: one or both connected to TS1-9

**NOTE:** Refer to the diagrams when connecting wires for the sensing heads. It is important to properly connect the sensing head wires. Improper connection of the sensing head wires may result in damage to the control module and/or the sensing head.

4. To operate more than one HAB unit from a HAB unit that is controlled by a snow detector(s), connect terminal posts #6 together and terminal posts #9 together (do not connect terminal post #6 to terminal post #9). When connecting snow detectors to more than one HAB unit, first connect one HAB. Then connect the snow detector to one more HAB. If the snow detector does not operate properly, exchange L1 and L2 on the newest HAB circuit breaker.

**NOTE:** BE SURE L1 AND L2 ARE DE-ENERGIZED BEFORE EXCHANGING THEM. Continue to add HABs to the snow detector in the same manner until all the desired HABs are connected. DO NOT EXCEED 200' CABLE LENGTH (18 AWG WIRE).

5. The sensing heads should be mounted in a vertical position.

**NOTE:** Experience has shown that positioning a snow detector sensing head in the switch area between the ties and between the switch point and the track duct is effective. A second sensing head is then placed away from the switch area, such as on a bungalow or pole.

## 9.2. Snow Detector Operation

**NOTE:** A snow detector sensing head only detects moisture. With temperature sensing capability, the HAB unit assumes moisture is due to snow when the air temperature is below set point. All operating functions are similar to remote operation with the following exceptions:

### 1. Indication

During normal operation under snow detector control, the indication contact across terminal posts 3 and 4 will not be closed.

### 2. Snow Detector Run Timer

During remote operation, if the snow detector senses moisture, the unit will operate according to the settings. The unit will then operate for the duration of the run timer setting.

### 3. Fault Condition

A fault condition under snow detector control will cause the indication contact across terminal posts TS-3 and TS-4 to close. To reset the unit after a fault condition, momentarily apply a circuit closure between terminal posts TS-1 and TS-2 with pushing the AUTO button. The unit may now be operated either under remote control or snow detector control.

## 9.3. Snow Detector Maintenance

The snow detector sensing head contains a small, self-regulating heater that will melt snow or ice into water. The sensing head relies on moisture to create a low resistance circuit path. The heater will also cause the moisture to evaporate within a short period. If the surface becomes non-conductive due to contamination by grease or oil, the sensing head will not operate. To ensure effective and dependable snow detector operation, it is important to inspect the sensing heads frequently and clean them thoroughly if necessary. Use a solution of water and mild detergent or isopropyl alcohol to clean the sensing grid. Use a clean, dry cloth to wipe the grid. Make sure there is no residue left on the surface.

## 9.4. Snow Detector Troubleshooting

**NOTE:** A newly-installed snow detector sensing head should operate 15-20 minutes to allow the internal heater to reach normal operating temperature.

### 9.4.1. No Heat on the Sensing Head

1. Check for voltage between terminal post 6 and 7, and between terminal post 6 and 8. It should be 18VAC (+2VAC). If not:
  - a. Check the display on the control module.
  - b. The control transformer may be defective.
  - c. There may be a bad circuit connection.
2. Remove the black and the green lead wires from the terminal posts. Check resistance between them. If resistance is greater than 10 ohms, the sensing head is defective and should be replaced.

### 9.4.2. Does Not Detect Moisture

1. Clean the snow detector as described in section 9.3.
2. If unit still does not detect moisture, check the wiring connections between detector head and terminal posts.
3. If unit still does not detect moisture, replace the control module with a known good control module. If still not operating properly, replace the sensing head.  
**NOTE:** If a snow detector head becomes saturated with moisture, it can sometimes be restored to normal operation by removing it and “baking” it in a conventional oven for several hours. Do not exceed 150°F.

### 9.4.3. Constant Indication of Moisture Detection

1. Clean the snow detector heads as described in section 9.3.
2. Remove white lead(s) from terminal post 9. If moisture indication is still on, the control module is defective and should be replaced.

## 10. Specifications

VOLTAGE:	230VAC, 1PH 60 HZ, 30 AMP
MOTOR:	2 HP, 3450RPM, TEFC 78 Amp starting current 11.5 Amp running current
VOLTAGE:	230VAC, 3PH 60 HZ, 15 AMP
MOTOR:	2HP, 3450RPM, TEFC 34 Amp starting current 5.8 Amp running current
VOLTAGE:	230VAC, 1PH 60 HZ, 30 AMP (3PH AC Drive)
MOTOR:	2 HP, 3450RPM, TEFC 14 Amp starting current 14 Amp running current
VOLTAGE:	460VAC, 3PH 60 HZ, 15 AMP
MOTOR:	2 HP, 3450RPM, TEFC 17.5 Amp starting current 2.9 Amp running current
VOLTAGE:	575VAC, 3PH 60 HZ, 15 AMP
MOTOR:	2 HP, 3450RPM, TEFC 19.5 Amp starting current 2.2 Amp running current
AIRFLOW:	2000 CFM
COMBUSTION RATE:	400,000 BTU/HR 200,000 BTU/HR
FUEL:	Propane or Natural Gas
FLOW RATE:	Natural Gas: 400 CFH/200 CFH Propane: 160 CFH/80 CFH (4.4 GPH/2.2 GPH)
INDICATION CONTACTS:	30VDC 1A or 125VAC 300mA
INCOMING GAS PRESSURE:	Low Pressure Regulator: 2 PSI – 10 PSI Optional High-Pressure Regulator: Max of 150 PSI
UNIT WEIGHT:	325 lbs. (148 kg)



## 11. Drawings

HAB POSITIONING	950N32963
GHAB MAIN SLIM HIGH PROFILE	9724-0510
GHAB MAIN UNIT HIGH PROFILE AC MOTOR	9508-7115
GHAB MAIN UNIT LOW PROFILE	9518-5117
TIE DUCT ASSEMBLY 136LB QUICK CHANGE	9528-4815
TIE DUCT ASSEMBLY 115LB QUICK CHANGE	9528-4615
POINT / TRACK ASSEMBLY RH	9508-4000
POINT / TRACK ASSEMBLY LH	9508-4001
NOZZLE TRACK DUCT ASSEMBLY	927490
ISOLATION KIT, TIE DUCT POINT NOZZLE	9278-0021
ISOLATION KIT, TIE DUCT TRACK NOZZLE	9278-0027
GHAB FOUNDATION	9288-0202
FLAME DUCT	9508-3415
HEAVY DUTY OFFSET DUCT	9528-3410
2' INSULATED FLEX DUCT WITH MIXER	9528-4222
TRACK DUCT, POINT, LG NOZZLE 10 FT	9278-1205
TRACK DUCT, 10', MID	9278-1201
TRACK DUCT, 10', HEEL	9278-1202
SWITCH ROD DUCT 7'	9278-0270
TRACK DUCT SUPPORT BRACKET ASSEMBLY	92774
GHAB ELECT. PANEL LAYOUT 230V 1 PHASE ASSY WIRED MOTOR. 230V	9508-0155 9538-0065
GHAB ELECT. PANEL LAYOUT 575V 3 PHASE ASSY WIRED MOTOR. 575V	9508-0158 9508-0062
GHAB ELECT. PANEL LAYOUT 480V 3 PHASE ASSY WIRED MOTOR. 480V	9508-0157 9538-0066
GHAB ELECT. PANEL LAYOUT AC DRIVE	9508-0154
GAS PIPING, 2 STAGE	9338-0238
BURNER ASSEMBLY	9508-0135
ASSEMBLY, 2 HP PRESSURE SWITCH	9508-0146
PRESSURE SWITCH CALIBRATION FLOWCHART	

## 12.Limited Warranty

Railway Equipment Co., Inc. (“Railway”) warrants all of its products to be free from defects in material and workmanship when used under specified operating conditions and within specified limits. Railway’s warranty shall extend for a period of two (2) years from the date of shipment to the original purchaser.

This warranty is expressly in lieu of and excludes all other expressed or implied warranties, including but not limited to warranties of merchantability and fitness for a particular purpose.

Railway, its agents, or representatives shall in no circumstance be liable for any direct, indirect, special, penal, or consequential loss or damage of any nature resulting from the malfunction of the product.

Remedies under this warranty are expressly limited to repair or replacement of the product at the sole discretion of Railway.

Before returning any defective product to Railway, contact the factory at the address or telephone number at the bottom of this article for a Return Merchandise Authorization number and instructions as to how and where the return is to be shipped. Materials received without this authorization will be returned at the customer’s expense.

Products returned to Railway under warranty must be shipped freight prepaid, and return freight charges for repaired or replaced products, in or out of warranty, will be at customer’s expense.

Railway reserves the right to reject any warranty claim on a product that has been altered by the user or damaged in shipping due to inadequate packaging or mishandling by freight carrier.

By returning a product to Railway the owner grants permission to Railway to open and disassemble the product as required for evaluation. Railway has the sole responsibility for determining the cause and nature of failure, and Railway’s determination with regard thereto shall be final. Railway reserves the right to repair or replace any unit at its sole discretion.

A returned product that is found, upon inspection by Railway, to be operational within specification is subject to an inspection and testing fee, regardless of its warranty period.

Railway’s liability on any claim of any kind (including negligence) for any loss or damage arising out of or resulting from this agreement, or from the performance of breach thereof, of from the products or services furnished hereunder, shall in no case exceed the price of the specific product or service which gives rise to the claim. All such liability shall terminate upon the expiration of the warranty period of two (2) years, as hereinabove stated.

The furnishing of advice or other assistance without separate compensation therefore will not subject Railway to any liability, either in contract, warranty, tort (including negligence) or otherwise.

Any alteration or modification of the product, or addition on non-Railway components to the product, unless expressly permitted by Railway in its documentation, will void warranty coverage.

This warranty is non-transferable, and warranty coverage is limited to initial user only.

Installation and/or use of the product shall demonstrate acceptance of the terms of this warranty.

Each of the foregoing paragraphs in this article will apply to the full extent permitted by law. The invalidity, in whole or part, of any paragraph will not affect the remainder of such paragraph or any other paragraph.

**RAILWAY EQUIPMENT CO.**

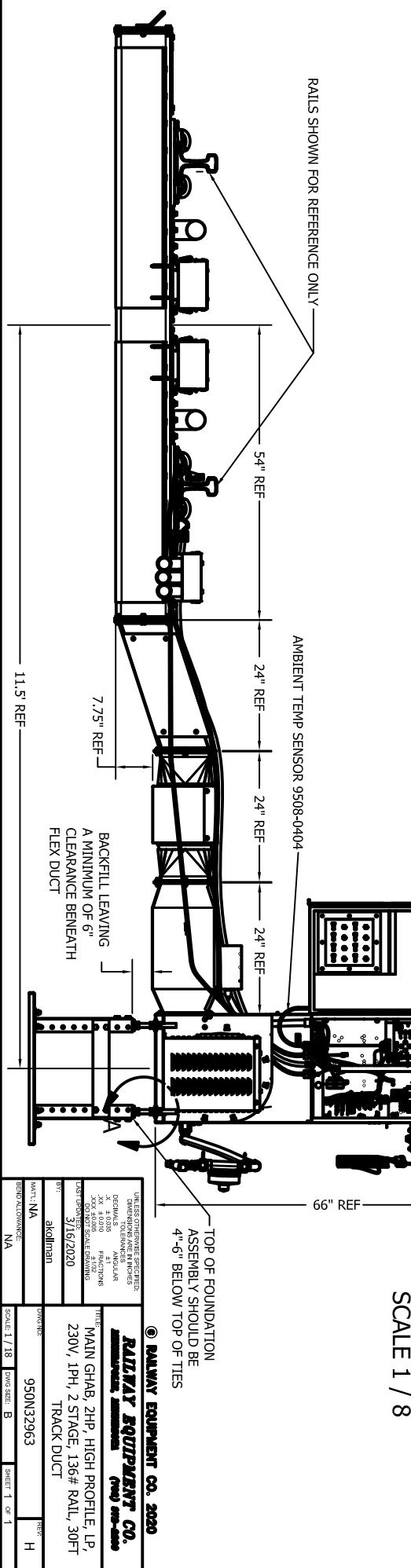
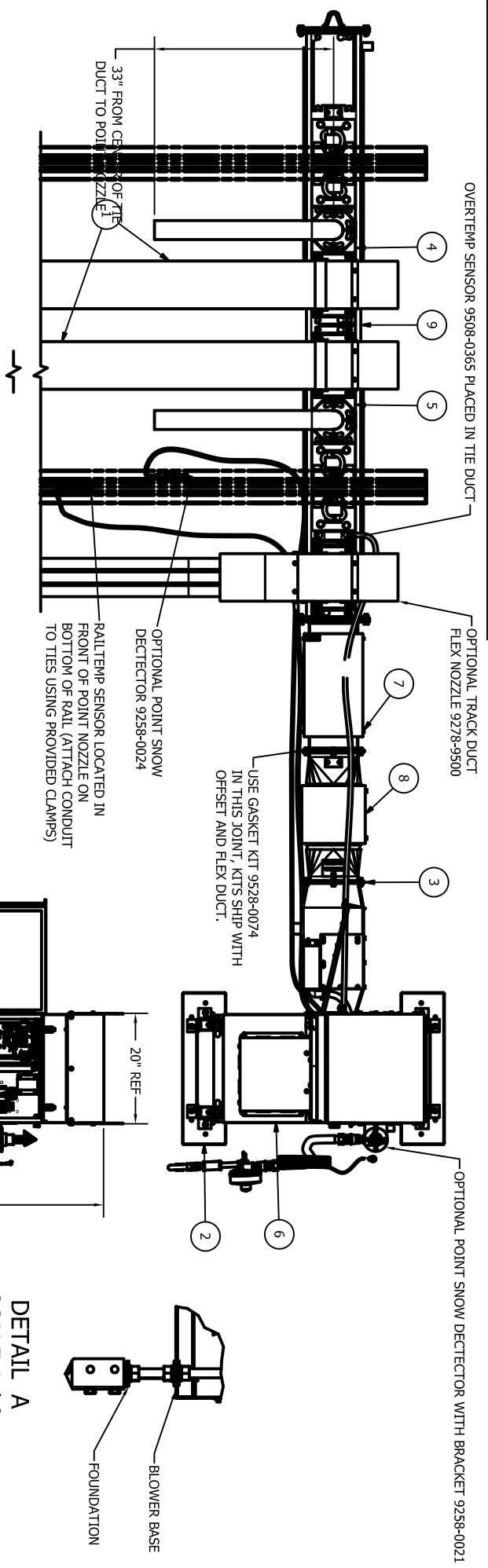
525 9<sup>th</sup> Street South, Delano, Minnesota 55328 USA

Tel. (763) 972-2200 Fax (763) 972-2900

E-Mail - [mail@rwy.com](mailto:mail@rwy.com)

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PARTS LIST				PARTS LIST							
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION	ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	9278-0233B	B	2	EA	TRACK DUCT 30'	6	9508-7115H	H	1	EA	MAIN GHAB, 2HP, HIGH PROFILE, LP, 230V 1PH
2	9288-0202	A	1	EA	FOUNDATION ASSY 2HP HAB BOLTED	7	9528-3410A	A	1	EA	DUCT, OFFSET, 2' HD NO MIXER, 6-HOLE FLANGE
3	9368-0106E	E	1	EA	DUCT ISOLATOR KIT, 9 X 9	8	9528-4222	A	1	EA	FLEX DUCT 2ST INS W/MIXER
4	9508-4000B	B	1	EA	POINT/TRACK NOZZLE ASSY RH	9	9528-4815A	A	1	EA	TIE DUCT, 136# QUICK CHANGE, 6-HOLE FLANGE
5	9508-4001B	B	1	EA	POINT/TRACK NOZZLE ASSY LH						



DETAIL A  
SCALE 1 / 8

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*Manufacturing Excellence*  
 (703) 999-2000

UNLESS OTHERWISE SPECIFIED:  
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 3/16 3/16 FRACTIONS  
 3/16/2020  
 DATE PUBLISHED  
 3/16/2020  
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 akollman  
 CHECKED BY  
 akollman  
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 DIVISION  
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 REVISIONS  
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 SHEET 1 OF 1

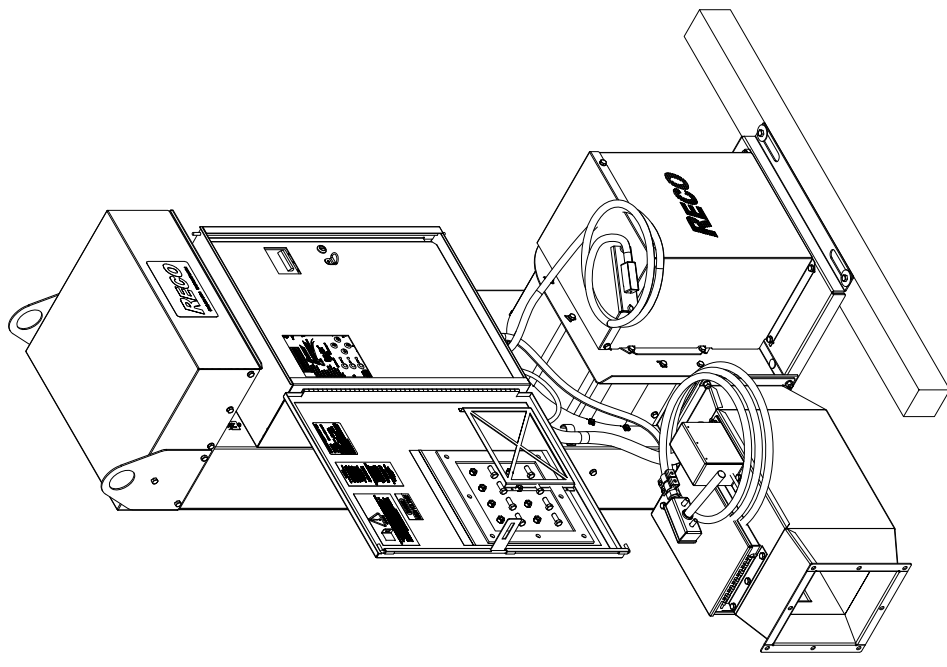
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 230V, 1PH, 2 STAGE, 136# RAIL, 30FT  
 TRACK DUCT

REV	ECO #	DESCRIPTION	DATE	BY
A	22-030	NEW PART	8/11/2022	CA

REV	ECO #	DESCRIPTION	DATE	BY
A	22-030	NEW PART	8/11/2022	CA

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	26003C	C	1	EA	INLET CONE, BLOWER
2	2600975600	-	4	EA	NUT, 5/16-18, CLIP ON, STEEL, BLACK PHOSPHATE
3	26042A	A	1	EA	ASSY, BLOWER WHEEL 2HP 7/8" ID
4	28035	-	6	EA	MOUNT, RUBBER, M/M 1/4-20
5	2831411112	-	1	EA	SCREW, #10-32 X 3/4 PAN SLT
6	2831651120	-	4	EA	BOLT, 5/16-18 X 1-1/4 HEX HEAD
7	2831851116	-	4	EA	BOLT, 3/8-16 X 1 HEX CAP
8	2832-3301	-	4	EA	NUT, 1/4-20 KEPS
9	2832-4101	-	2	EA	NUT, #10-32 HEX
10	2832-5101	-	12	EA	NUT, 1/4-20 HEX
11	2832-5901	-	6	EA	NUT, 1/4-20 CENTERLOCK
12	2832-8101	-	4	EA	NUT, 3/8-16 HEX
13	2833-4210	-	1	EA	WASHER, #10 SPLIT LOCK
14	2833-4310	-	2	EA	WASHER, #10 EXT. STAR
15	2833-5110	-	6	EA	WASHER, 1/4 FLAT
16	2833-5115	-	2	EA	WASHER, 1/4 FLAT SS
17	2833-5119	-	4	EA	WASHER, 1/4 X 1.5 FENDER
18	2833-5211	-	12	EA	WASHER, 1/4 SPLIT LOCK
19	2833-5241	-	2	EA	WASHER, 1/4 SPLIT LOCK SS
20	2833-8040	-	4	EA	RIVET, BUTTON HEAD PLATED STL
21	2833-8210	-	4	EA	WASHER, 3/8 SPLIT LOCK
22	29051	-	28	EA	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
23	3000022500	-	1	EA	LATCH, REQUIRES TOOL TO OPEN
24	3181251032	-	1	EA	PULL RING, 316 SS, 13/16" INNER WIDTH .240 THRU HOLE MOUNT
25	60002	-	1	EA	3/8 ROMEX BRIDGEPORT# 650-DC2
26	60030	-	1	EA	CONDUIT, CLAMP
27	60076	-	1	EA	CONDUIT, FLEX CLAMPS 3/4 IN
28	60169	-	5	EA	TY-RAP 0.30 X 8
29	60185A	A	8	FT	GASKET, 25X.75 ADHESIVE BACK
30	6093-0100	-	5	EA	CABLE TIE 4IN 0.10 WIDTH
31	6093-0102	-	12	EA	TY-RAP
32	61000	-	1	EA	U-BOLT, MRO BOLT #05
33	61001	-	1	EA	ELBOW, 3/4IN SCH 40 BLACK
34	61015	-	1	EA	NIPPLE, 3/4 X 5 SCH 40 BLACK
35	61057	-	1	EA	NIPPLE, 3/4 X 3.5 SCH 40 BLACK
36	61191	-	2	FT	GASKET, HI TEMP SILICONE, 0.5W X 0.25 H, WITH ADHESIVE BACK
37	8039-0806A	A	1	EA	LABEL, HIGH VOLTAGE
38	8040-0950F	F	1	EA	NAMEPLATE, 950/951 GHAB
39	92733G	G	1	EA	GASKET 7.75SQ X10.5SQ SILICONE
40	9300-3356A	A	2	EA	ENCLOSURE, INNER DOOR, HINGE PIN, 3/16 OD, SS, 3"
41	9338-0245A	A	1	EA	GHAB GAS PIPING W PRESS SENSOR, 2HP GHAB SLIM
42	9507-0027C	C	1	EA	ASSY, GAS LINE ACCESSORIES 2HP
43	9508-0038A	A	1	EA	ASSY, GAS SENSOR EXT CABLE
44	9508-0064A	A	1	EA	ASSY, WIRED MOTOR, 2HP/575/3PH WITH FEET
45	9508-0135C	C	1	EA	BURNER, 6 INCH VERTICAL

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
46	9508-0143A	A	1	EA	FLAME DUCT, BURNER ACCESS DOOR, 2HP, TOP COVER, HINGE PLATE
47	9508-0144A	A	1	EA	FLAME DUCT, BURNER ACCESS COVER, 2HP, SIDE COVER, HINGE PLATE
48	9508-0158B	B	1	EA	ASSY, GHAB CONTROL 2HP 575V 3PH
49	9508-0166A	A	1	EA	ASSY, 2HP, HIGH PROFILE, PRESSURE SENSOR BLOWER ASSEMBLY
50	9508-0223C	C	1	EA	ASSY, IGNITION WIRE
51	9508-0243A	A	1	EA	FLAME DUCT, BURNER ACCESS DOOR, 2HP, SIDE, HINGE PIN, 3/16 OD, SS, 8.75"
52	9508-0244A	A	1	EA	FLAME DUCT, BURNER ACCESS DOOR, TOP, HINGE PIN, 3/16 OD, SS, 6.5"
53	9508-0365E	E	1	EA	OVERTEMP, ASSY, HI/OVER TEMP SENSOR, W COPPER ROD, 15 FT, TIE DUCT MOUNT
54	9508-0404A	A	1	EA	AIR TEMPERATURE SENSOR 4" MAGNETIC
55	9508-0415B	B	1	EA	RAIL TEMP SNRS T/C MAGNETIC
56	9508-0430A	A	1	EA	ASSY, WIRED IGNITION XFMR
57	9508-0496B	B	1	EA	ASSY, FLAME WIRE
58	9508-0811A	A	1	EA	FLAME DUCT, 2HP, 2" WELDMENT, WITH BAC FLANGES
59	9508-0816A	A	1	EA	FLAME DUCT, 2HP, BURNER ACCESS DOOR, WIDE SIDE COVER
60	9508-0817A	A	1	EA	FLAME DUCT, 2HP, BURNER ACCESS DOOR, WIDE TOP COVER
61	9508-1056A	A	1	EA	BRACKET, GAS SUPPORT INSIDE, 2HP
62	9508-5347A	A	1	EA	ENCLOSURE, GHAB WELDMENT, 2HP HIGH PROFILE, W/DID
63	9528-0074D	D	1	EA	GASKET KIT, 9X9 5HP DUCTWORK
64	9538-5046A	A	1	EA	ENCLOSURE, GHAB, INNER DOOR, 2/5HP, HIGH AND LOW PROFILE, 480/575V, 3PH
65	9720-0202A	A	1	EA	FOUNDATION ASSY 2HP HAB SLIM BOLTED
66	9720-1000A	A	1	EA	GHAB SLIM, HIGH PROFILE, 2HP, SHELL ASSEMBLY
67	9809-1051	-	1	EA	RRAMAC LIFETIME ASSET REGISTRATION FEE
68	R8039-0816A	A	2	EA	LABEL, FAN ROTATION
69	R8039-0830A	A	1	EA	LABEL, GHAB WARNINGS
70	R8039-0951A	A	1	EA	LABEL, GAS CONNECTION/BULKHEAD
71	R8039-0955B	B	1	EA	LABEL, ID PLATE AGA/CSA
72	R8039-0980A	A	1	EA	LABEL, DANGER HIGH VOLTAGE
73	R9500-0100A	A	1	EA	LABEL, GHAB MENU
74	R9500-0115H	H	2	EA	LABEL, MANUAL, 950/951 WITH T/C & 230
75	R960031	-	2	EA	LABEL, HAB ENCLOSURE
76	R99001A	A	1	EA	LABEL, CAUTION LABEL INSIDE GHAB ENCLOSURES

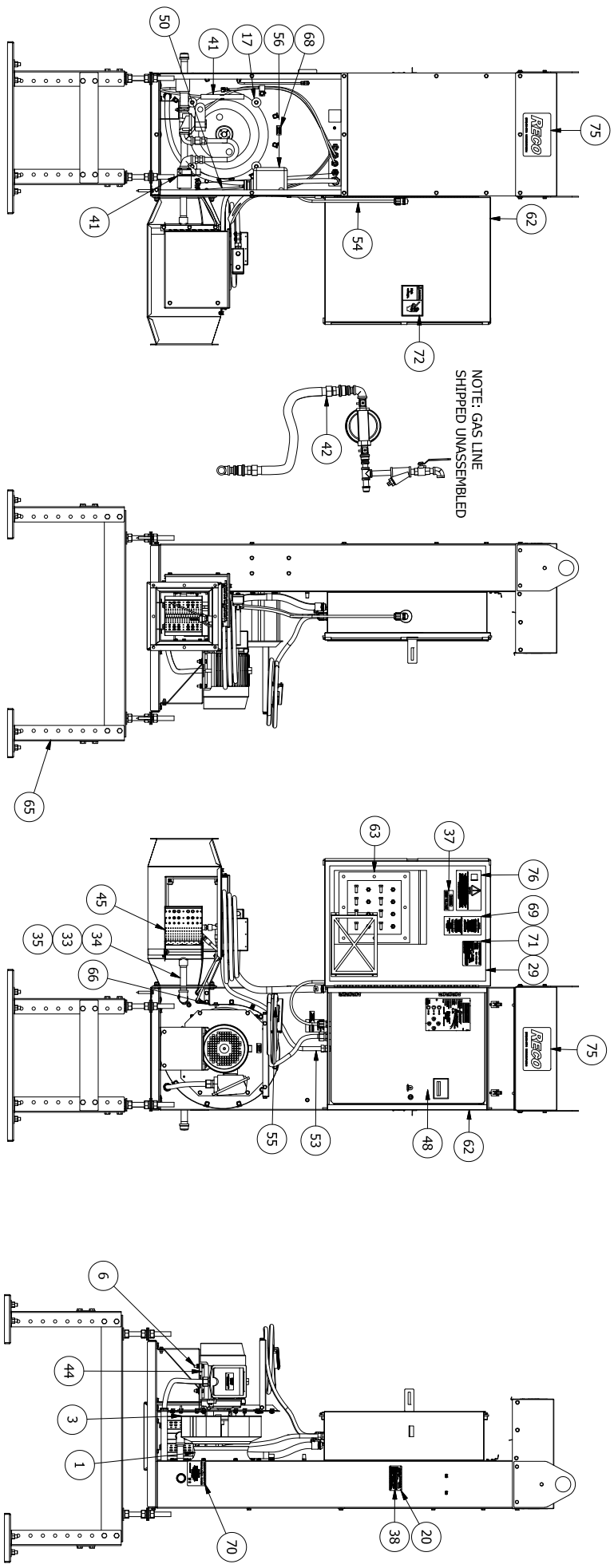


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FRACTIONS - XX 3/16  
TOLERANCES - DIMENSIONS TO BE DRAWN TO  
LAST UPDATE: 8/11/2022  
BY: cwarderson

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**RAILWAY EQUIPMENT CO.**  
MINNEAPOLIS, MINNESOTA (763) 972-2200

TITLE: MAIN GHAB SLIM, HIGH PROFILE, 2HP, NG, 575V, 3PH, W/ FOUNDATION

DWG NO: 9724-0510A  
SCALE: 1 / 11  
DWG SIZE: B  
SHEET 1 OF 2



NOTE: GAS LINE  
SHIPPED UNASSEMBLED

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		RAILWAY EQUIPMENT CO. MINNEAPOLIS, MINNESOTA (763) 972-2200	
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.XX	DO NOT SCALE DRAWING	2HP, NG, 575V, 3PH, W/ FOUNDATION	
DATE	BY	DWG NO.	REV.
8/11/2022	cvanderdon	9724-0510A	A
WGT.	N/A	SCALE	1/16
TRD ALLOWANCE	N/A	DWG SIZE	B
		SHEET	2 OF 2

REV	ECO #	DESCRIPTION	DATE	BY
B	11-0014	UPDATED CONTROL MODULE REV J	06/15/11	GJ
C	11-0018	RELOCATION OF SAIL	11/21/11	MP
D	15-0029	SUB-ASSEMBLIES REV'D UP	7/14/15	BF
E	14-0004	UPDATED PANEL	06/15/2016	MEM
H	18-0034	PANEL, ENCLOSURE, OVERTEMP	1/7/2019	JT
-	-	R9500-0115F TO G	3/6/2020	CA

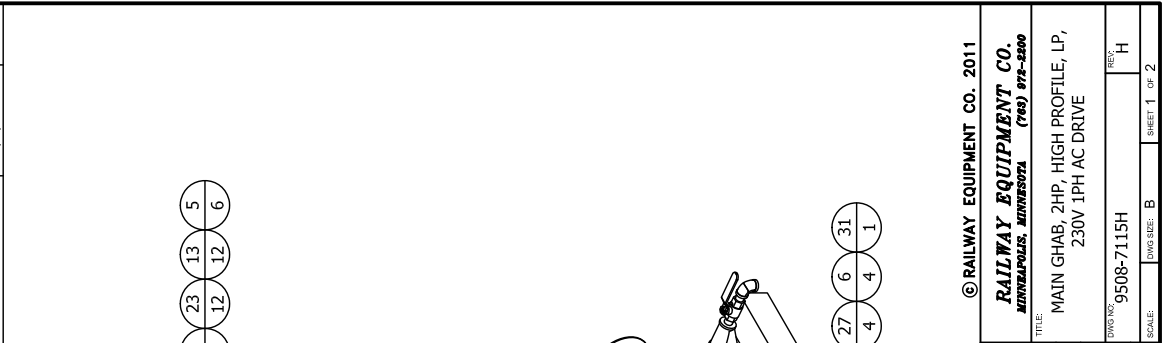
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D	15-0029	SUB-ASSEMBLIES REV'D UP	7/14/15	BF
E	14-0004	UPDATED PANEL	06/15/2016	MEM
H	18-0034	PANEL, ENCLOSURE, OVERTEMP	1/7/2019	JT
-	-	R9500-0115F TO G	3/6/2020	CA

REV	ECO #	DESCRIPTION	DATE	BY
B	11-0014	UPDATED CONTROL MODULE REV J	06/15/11	GJ
C	11-0018	RELOCATION OF SAIL	11/21/11	MP
D	15-0029	SUB-ASSEMBLIES REV'D UP	7/14/15	BF
E	14-0004	UPDATED PANEL	06/15/2016	MEM
H	18-0034	PANEL, ENCLOSURE, OVERTEMP	1/7/2019	JT
-	-	R9500-0115F TO G	3/6/2020	CA

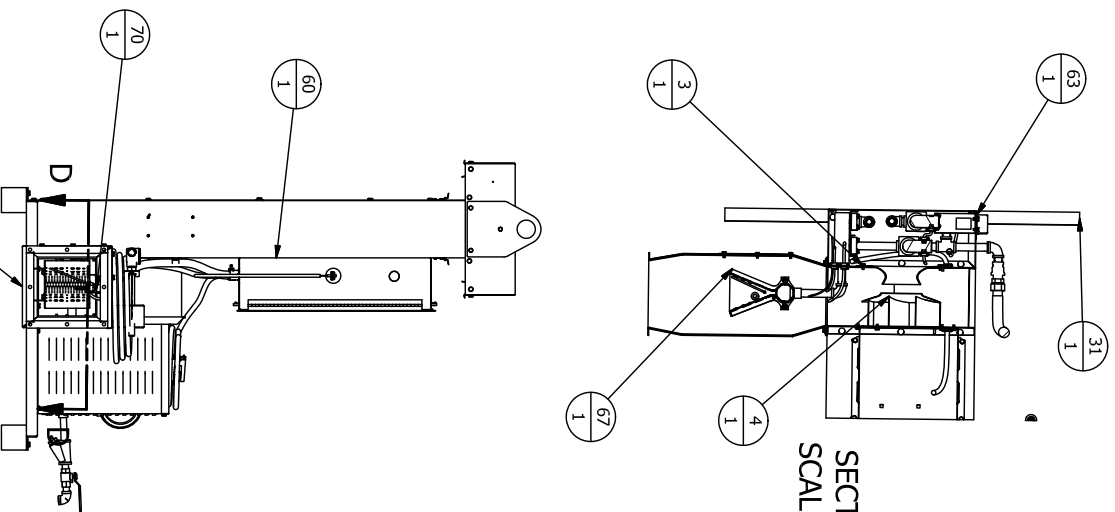


ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
61	95048B	B	EA	1	INTAKE BODY, HIGH PROFILE, 2HP
62	95050A	A	EA	1	BRACKET, GAS SUPPORT TOP
63	95059A	A	EA	1	COVER, WUFFLER GHAB
64	95080B	B	EA	1	COVER PLATE, GAS LINE 5 & 3HP
65	9507-0027C	C	EA	1	ASSY, GAS LINE ACCESSORIES 2HP
66	9508-0038A	A	EA	1	ASSY, GAS SENSOR EXT CABLE
67	9508-0139C	C	EA	1	BURNER, 6 INCH VERTICAL
68	9508-0146A	A	EA	1	ASSY, 2HP PRESSURE SWITCH AND SENSOR BLOWER ASSEMBLY
69	9508-0156C	C	EA	1	ASSY, GHAB CONTROL PANEL 2HP 230V 1PH
70	9508-0223C	C	EA	1	ASSY, IGNITION WIRE
71	9508-0365B	B	EA	1	ASSY, HI TEMP SENSOR OR 11FT FLEX DUCT MOUNT
72	9508-0404A	A	EA	1	AIR TEMPERATURE SENSOR 4" MAGNETIC
73	9508-0415B	B	EA	1	RAIL TEMP SNR T/C MAGNETIC
74	9508-0430A	A	EA	1	ASSY, WIRED IGNITION XFMR
75	9508-0498B	B	EA	1	ASSY, FLAME WIRE
76	950811A	A	EA	1	WIDMT, 2" FLAME DUCT GALV
77	950814A	A	EA	1	COVER, 2" FLAME DUCT 6" MAXON
78	950832A	A	EA	2	LIFTING PLATE 2HP
79	95093A	A	EA	1	COVER, HAB MOTOR BOLT-TOGETHER
80	95094A	A	EA	1	COVER PLATE, HAB MOTOR BOLT-TO
81	9528-0074D	D	EA	1	GASKET KIT, 9X9 5HP DUCTWORK
82	9809-1051	*	EA	1	RRAMAC LIFETIME ASSET REGISTRATION FEE
83	R8039-0816A	A	EA	1	LABEL, FAN ROTATION
84	R8039-0830A	A	EA	1	LABEL, GHAB WARNINGS
85	R8039-0951A	A	EA	1	LABEL, GAS CONNECTION BULKHEAD
86	R8039-0955B	B	EA	1	LABEL, ID PLATE AGACSA
87	R9500-0115G	G	EA	2	MANUAL, 950/951 WITH T/C & 230V 1 PHASE
88	R960031	*	EA	2	LABEL, HAB ENCLOSURE
89	R99001A	A	EA	1	LABEL, CAUTION LABEL INSIDE GHAB ENCLOSURES

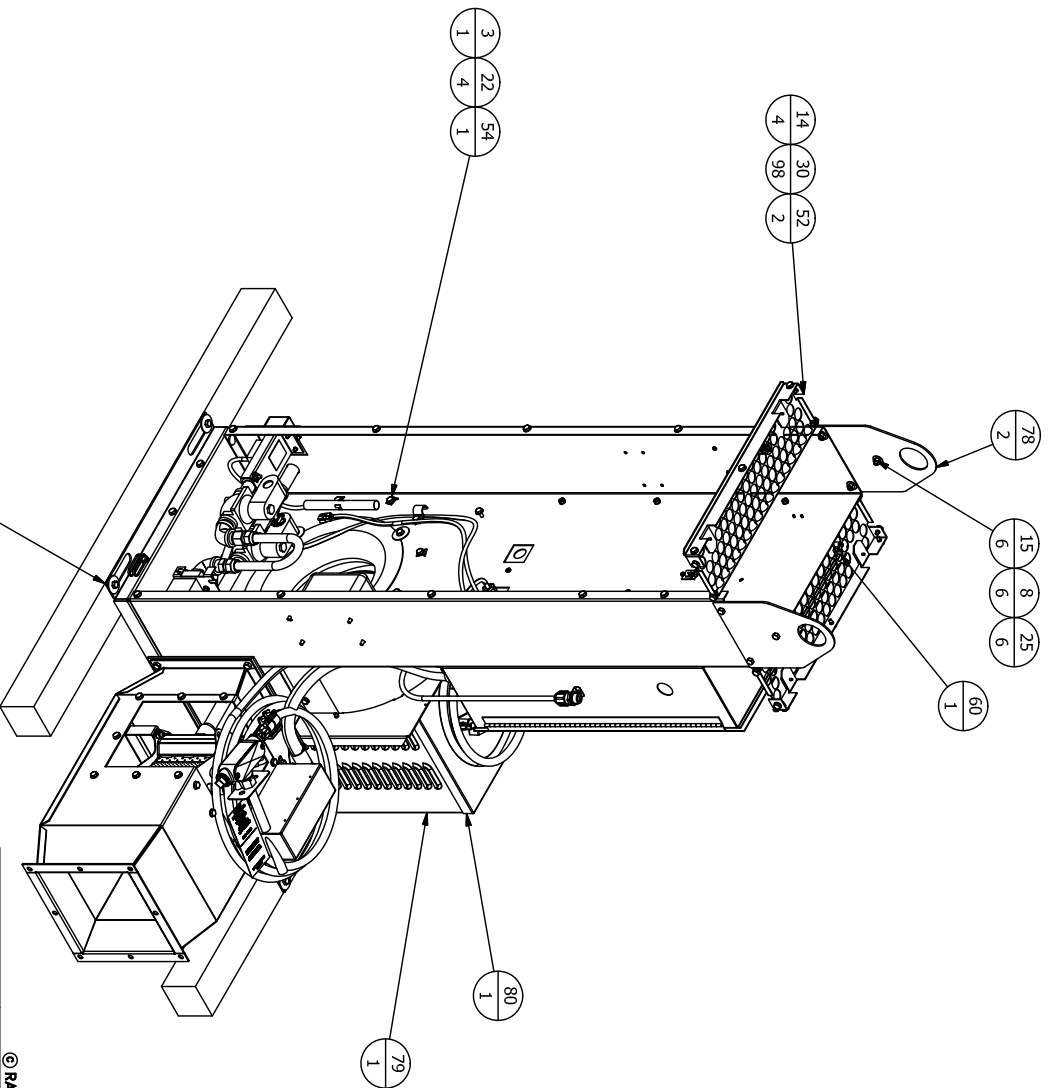
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	14185	*	EA	4	LATCH FOR SCREENS
2	16003	*	EA	.33	RTV SILICONE CLEAR 10-0Z TUBE
3	28003C	C	EA	1	INLET CONE, BLOWER
4	28006E	E	EA	1	ASSY, BLOWER WHEEL
5	28005	*	EA	6	MOUNT, RUBBER, M/M 1/4-20
6	28045	*	EA	4	BOLT, 3/8 X 2-1/2 HEX LAG
7	283141112	*	EA	1	SCREW, #10-32 X 3/4 PAN SLT
8	2831651112	*	EA	6	BOLT, 5/16-18 X 3/4 HEX HEAD
9	2831851112	*	EA	4	BOLT, 3/8-16 X 3/4 HEX HEAD
10	2831851116	*	EA	4	BOLT, 3/8-16 X 1 HEX CAP
11	2831861112	*	EA	8	BOLT, 3/8-16 X 3/4 CARRIAGE
12	2832-4101	*	EA	2	NUT, #10-32 HEX
13	2832-5101	*	EA	12	NUT, 1/4-20 HEX
14	2832-5901	*	EA	4	NUT, 1/4-20 CENTERLOCK
15	2832-6901	*	EA	6	NUT, 5/16-18 CENTERLOCK
16	2832-8101	*	EA	4	NUT, 3/8-16 HEX
17	2832-8904	*	EA	8	NUT, 3/8-16 CENTERLOCK
18	2833-4210	*	EA	1	WASHER, #10 SPLIT LOCK
19	2833-4310	*	EA	2	WASHER, #10 EXT. STAR
20	2833-5110	*	EA	6	WASHER, 1/4 FLAT
21	2833-5115	*	EA	2	WASHER, 1/4 FLAT SS
22	2833-5119	*	EA	4	WASHER, 1/4 X 1.5 FENDER
23	2833-5211	*	EA	12	WASHER, 1/4 SPLIT LOCK
24	2833-5241	*	EA	2	WASHER, 1/4 SPLIT LOCK SS
25	2833-6110	*	EA	6	WASHER, 5/16 FLAT SAE
26	2833-8040	*	EA	4	RIVET, BUTTON HEAD PLATED STL
27	2833-8119	*	EA	4	WASHER, 3/8 X 1-1/2 FENDER
28	2833-8210	*	EA	8	WASHER, 3/8 SPLIT LOCK
29	29017	*	EA	8	BOLT, #6-32 X 3/8 WASHER HEAD
30	30951	*	EA	98	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
31	32007	*	EA	1	POST, 4 X 4 X 8 TREATED
32	60002	*	EA	1	3/8 ROMEX BRIDGEPORT# 650-DC2
33	60030	*	EA	1	CONDUIT, CLAMP
34	60073	*	EA	2	BUSHING, CONNECTOR 3/4 INCH
35	60076	*	EA	1	CONDUIT, FLEX CLAMPS 3/4 IN
36	60169	EA	EA	5	TY-RAP 0.30 X 8
37	60185A	A	EA	8	GASKET, .25X.75 ADHESIVE BACK
38	6093-0100	*	EA	5	CABLE TIE, 4IN 0.10 WIDTH
39	6093-0102	*	EA	12	TY-RAP
40	61000	*	EA	1	U-BOLT, MRO BOLT #65
41	61001	*	EA	1	ELBOW, 3/4IN SCH 40 BLACK
42	61015	*	EA	1	NIPPLE, 3/4 X 5 SCH 40 BLACK
43	61057	*	EA	1	NIPPLE, 3/4 X 3.5 SCH 40 BLACK
44	61064	*	EA	1	CONDUIT NIPPLE, 3/4 X 9
45	8040-0950F	F	EA	1	NAMEPLATE, 950/951 GHAB
46	92733G	G	EA	1	GASKET 7.75SQ X10.65Q SILICONE
47	92919A	A	EA	4	WASHER, 1/4 EXT. STAR
48	93309F	F	EA	1	INTAKE TOP, HAB
49	93315B	B	EA	1	COVER, LOWER INTAKE, GALV
50	93316D	D	EA	1	COVER, UPPER INTAKE, GALV
51	933254B	B	EA	2	INTAKE SCREEN, FLIP DOWN 1"
52	933266A	A	EA	2	DRIP RAIL, HAB WITH LATCHES
53	933600A	A	EA	1	BLOWER OUTLET FLANGE
54	933603A	A	EA	1	BLOWER SHROUD
55	9336-0128B	B	EA	1	ASSY, WIRED MOTOR 2HP 230V 1PH
56	9336-0238C	C	EA	1	GHAB GAS PIPING W PRESS SENSOR
57	95040B	B	EA	1	BASE, HAB BOLT-TOGETHER
58	95044B	B	EA	1	MOTOR SHROUD MOUNTING PLATE, HAB
59	95046A	A	EA	1	MOTOR MOUNTING PLATE, HAB
60	95047B	B	EA	1	ENCLOSURE, HAB

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
48	95047B	B	EA	1	ENCLOSURE, HAB
49	93315B	B	EA	1	COVER, LOWER INTAKE, GALV
50	93316D	D	EA	1	COVER, UPPER INTAKE, GALV
51	933254B	B	EA	2	INTAKE SCREEN, FLIP DOWN 1"
52	933266A	A	EA	2	DRIP RAIL, HAB WITH LATCHES
53	933600A	A	EA	1	BLOWER OUTLET FLANGE
54	933603A	A	EA	1	BLOWER SHROUD
55	9336-0128B	B	EA	1	ASSY, WIRED MOTOR 2HP 230V 1PH
56	9336-0238C	C	EA	1	GHAB GAS PIPING W PRESS SENSOR
57	95040B	B	EA	1	BASE, HAB BOLT-TOGETHER
58	95044B	B	EA	1	MOTOR SHROUD MOUNTING PLATE, HAB
59	95046A	A	EA	1	MOTOR MOUNTING PLATE, HAB
60	95047B	B	EA	1	ENCLOSURE, HAB

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
61	95048B	B	EA	1	INTAKE BODY, HIGH PROFILE, 2HP
62	95050A	A	EA	1	BRACKET, GAS SUPPORT TOP
63	95059A	A	EA	1	COVER, WUFFLER GHAB
64	95080B	B	EA	1	COVER PLATE, GAS LINE 5 & 3HP
65	9507-0027C	C	EA	1	ASSY, GAS LINE ACCESSORIES 2HP
66	9508-0038A	A	EA	1	ASSY, GAS SENSOR EXT CABLE
67	9508-0139C	C	EA	1	BURNER, 6 INCH VERTICAL
68	9508-0146A	A	EA	1	ASSY, 2HP PRESSURE SWITCH AND SENSOR BLOWER ASSEMBLY
69	9508-0156C	C	EA	1	ASSY, GHAB CONTROL PANEL 2HP 230V 1PH
70	9508-0223C	C	EA	1	ASSY, IGNITION WIRE
71	9508-0365B	B	EA	1	ASSY, HI TEMP SENSOR OR 11FT FLEX DUCT MOUNT
72	9508-0404A	A	EA	1	AIR TEMPERATURE SENSOR 4" MAGNETIC
73	9508-0415B	B	EA	1	RAIL TEMP SNR T/C MAGNETIC
74	9508-0430A	A	EA	1	ASSY, WIRED IGNITION XFMR
75	9508-0498B	B	EA	1	ASSY, FLAME WIRE
76	950811A	A	EA	1	WIDMT, 2" FLAME DUCT GALV
77	950814A	A	EA	1	COVER, 2" FLAME DUCT 6" MAXON
78	950832A	A	EA	2	LIFTING PLATE 2HP
79	95093A	A	EA	1	COVER, HAB MOTOR BOLT-TOGETHER
80	95094A	A	EA	1	COVER PLATE, HAB MOTOR BOLT-TO
81	9528-0074D	D	EA	1	GASKET KIT, 9X9 5HP DUCTWORK
82	9809-1051	*	EA	1	RRAMAC LIFETIME ASSET REGISTRATION FEE
83	R8039-0816A	A	EA	1	LABEL, FAN ROTATION
84	R8039-0830A	A	EA	1	LABEL, GHAB WARNINGS
85	R8039-0951A	A	EA	1	LABEL, GAS CONNECTION BULKHEAD
86	R8039-0955B	B	EA	1	LABEL, ID PLATE AGACSA
87	R9500-0115G	G	EA	2	MANUAL, 950/951 WITH T/C & 230V 1 PHASE
88	R960031	*	EA	2	LABEL, HAB ENCLOSURE
89	R99001A	A	EA</		



SECTION D-D  
SCALE 0.06 : 1



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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS 25 TH ANGLULAR XX 4 0010 FRACTIONS 30 NOT SCALE DRAWING		DRAWN: JTHEISEN	
DATE: 11/29/2017		DWG NO: 9508-7115H	
TITRE MAIN GHAB, 2HP, HIGH PROFILE, LP, 230V 1PH AC DRIVE		REV: H	
REVISIONS	SCALE: B	DWG SIZE: B	SHEET 2 OF 2

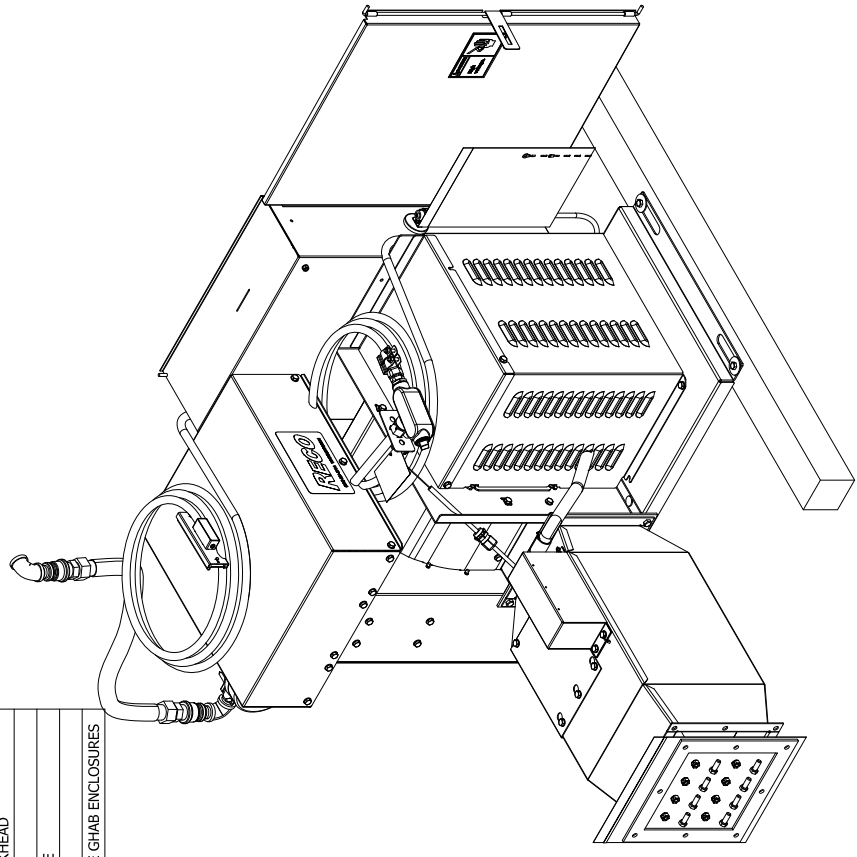


REV	ECO #	DESCRIPTION	DATE	BY
G	21-051	UPDATED REV	3/5/2021	CA
-	E21-095	MODIFIED TO USE SHELL ASSEMBLY 9518-1000A	05/27/2021	AK

ITEM	REV	QTY	UOM	DESCRIPTION
55	9518-0240B	B	1 EA	GHAB GAS PIPING W PRESS SENSOR
56	9518-0496B	B	1 EA	ASSY, FLAME WIRE
57	9518-1000A	A	1 EA	GHAB, 2HP, LOW PROFILE, SHELL ASSEMBLY
58	9528-0074D	D	1 EA	GASKET KIT, 9X9 5HP DUCTWORK
59	9538-0066A	A	1 EA	ASSY, WIRED MOTOR, 2HP/460/3PH
60	9809-1051	-	1 EA	RRAMAC LIFETIME ASSET REGISTRATION
61	R8039-0816A	A	2 EA	LABEL, FAN ROTATION
62	R8039-0830A	A	1 EA	LABEL, GHAB WARNINGS
63	R8039-0951A	A	1 EA	LABEL, GAS CONNECTION/BULKHEAD
64	R8039-0955B	B	1 EA	LABEL, ID PLATE AGA/CSA
65	R8039-0980A	A	1 EA	LABEL, DANGER HIGH VOLTAGE
66	R960031	-	2 EA	LABEL, HAB ENCLOSURE
67	R99001A	A	1 EA	LABEL, CAUTION LABEL INSIDE GHAB ENCLOSURES

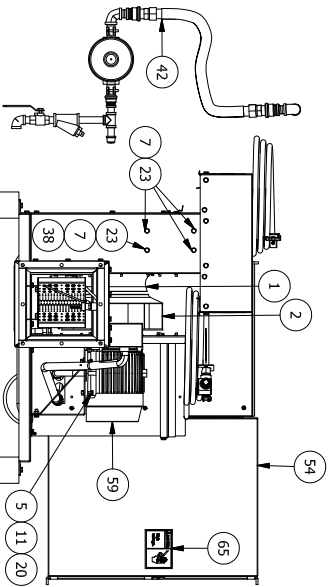
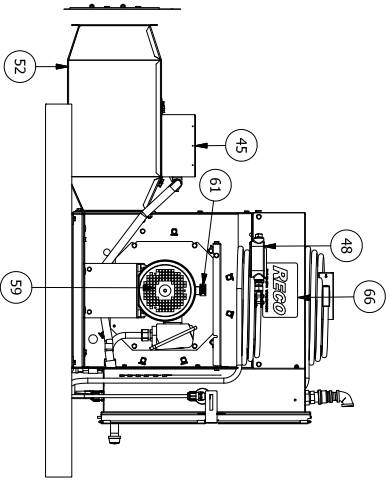
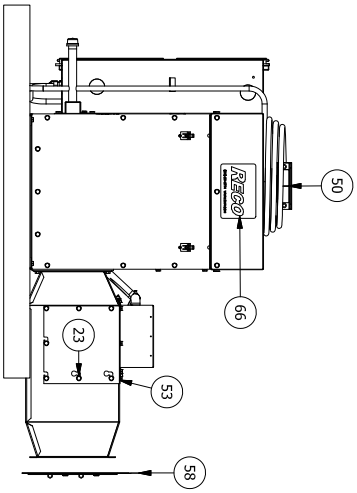
ITEM	REV	QTY	UOM	DESCRIPTION
1	26003C	C	1 EA	INLET CONE, BLOWER
2	26042A	A	1 EA	ASSY, BLOWER WHEEL 2HP 7/8" ID
3	28035	-	6 EA	MOUNT, RUBBER, M/M 1/4-20
4	283141112	-	1 EA	SCREW, #10-32 X 3/4 PAN SLT
5	2831651120	-	4 EA	BOLT, 5/16-18 X 1-1/4 HEX HEAD
6	2831851116	-	4 EA	BOLT, 3/8-16 X 1 HEX CAP
7	2832-3301	-	4 EA	NUT, 1/4-20 KEPS
8	2832-4101	-	2 EA	NUT, #10-32 HEX
9	2832-5101	-	11 EA	NUT, 1/4-20 HEX
10	2832-5901	-	2 EA	NUT, 1/4-20 CENTERLOCK
11	2832-6101	-	4 EA	NUT, 5/16-18 HEX
12	2832-8101	-	4 EA	NUT, 3/8-16 HEX
13	2833-4210	-	1 EA	WASHER, #10 SPLIT LOCK
14	2833-4310	-	2 EA	WASHER, #10 EXT. STAR
15	2833-5110	-	6 EA	WASHER, 1/4 FLAT
16	2833-5115	-	2 EA	WASHER, 1/4 FLAT SS
17	2833-5119	-	4 EA	WASHER, 1/4 X 1.5 FENDER
18	2833-5211	-	11 EA	WASHER, 1/4 SPLIT LOCK
19	2833-5241	-	2 EA	WASHER, 1/4 SPLIT LOCK SS
20	2833-6210	-	4 EA	WASHER, 5/16 SPLIT LOCK
21	2833-8040	-	4 EA	RIVET, BUTTON HEAD PLATED STL
22	2833-8210	-	4 EA	WASHER, 3/8 SPLIT LOCK
23	29051	-	38 EA	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
24	60002	-	1 EA	3/8 ROMEX BRIDGEPORT# 650-DC2
25	60030	-	3 EA	CONDUIT, CLAMP
26	60169	-	5 EA	TY-RAP
27	60172	-	1 EA	U-BOLT, MRO BOLT #05
28	60185A	A	1 EA	LUG, RING #10 22-18GA HI-TEMP
29	6093-0100	-	5 EA	GASKET, .25X.75 ADHESIVE BACK
30	6093-0102	-	12 EA	CABLE TIE, 4IN 0.10 WIDTH
31	61000	-	1 EA	TY-RAP
32	61001	-	1 EA	ELBOW, 3/4IN SCH 40 BLACK
33	61015	-	1 EA	NIPPLE, 3/4 X 5 SCH 40 BLACK
34	61057	-	1 EA	NIPPLE, 3/4 X 3.5 SCH 40 BLACK
35	8039-0806A	A	1 EA	LABEL, HIGH VOLTAGE
36	8040-0950F	F	1 EA	NAMEPLATE, 950/951 GHAB
37	92733G	G	1 EA	GASKET 7.75SQ X10.5SQ SILICONE
38	92919A	A	1 EA	WASHER, 1/4 EXT. STAR
39	95050A	A	1 EA	BRACKET, GAS SUPPORT TOP
40	95059A	A	1 EA	COVER, MUFFLER GHAB
41	95060B	B	1 EA	COVER PLATE, GAS LINE 5 & 3HP
42	9507-0027C	C	1 EA	ASSY, GAS LINE ACCESSORIES 2HP
43	9508-0036A	A	1 EA	ASSY, GAS SENSOR EXT CABLE
44	9508-0135C	C	1 EA	BURNER, 6" VERTICAL
45	9508-0149A	A	1 EA	ASSY, 2HP LOW PRO PRESSURE SENSOR BLOWER ASSEMBLY
46	9508-0157B	B	1 EA	ASSY, GHAB CONTROL PANEL 2HP 460V 3PH
47	9508-0223C	C	1 EA	ASSEMBLY, IGNITION WIRE
48	9508-0365D	D	1 EA	ASSY, HI TEMP SENSOR CR 15 FT TIE DUCT MOUNT
49	9508-0404A	A	1 EA	AIR TEMPERATURE SENSOR 4" MAGNETIC
50	9508-0415B	B	1 EA	RAIL TEMP SNSR T/C MAGNETIC
51	9508-0433A	A	1 EA	ASSY, WIRED IGNITION XFMR
52	950811A	A	1 EA	WLDMT, 2" FLAME DUCT GALV
53	950814A	A	1 EA	COVER, 2" FLAME DUCT 6" MAXON ENCLOSURE, HAB
54	95131B	B	1 EA	ENCLOSURE, HAB

PARTS LIST				
ITEM	REV	QTY	UOM	DESCRIPTION
55	9518-0240B	B	1 EA	GHAB GAS PIPING W PRESS SENSOR
56	9518-0496B	B	1 EA	ASSY, FLAME WIRE
57	9518-1000A	A	1 EA	GHAB, 2HP, LOW PROFILE, SHELL ASSEMBLY
58	9528-0074D	D	1 EA	GASKET KIT, 9X9 5HP DUCTWORK
59	9538-0066A	A	1 EA	ASSY, WIRED MOTOR, 2HP/460/3PH
60	9809-1051	-	1 EA	RRAMAC LIFETIME ASSET REGISTRATION
61	R8039-0816A	A	2 EA	LABEL, FAN ROTATION
62	R8039-0830A	A	1 EA	LABEL, GHAB WARNINGS
63	R8039-0951A	A	1 EA	LABEL, GAS CONNECTION/BULKHEAD
64	R8039-0955B	B	1 EA	LABEL, ID PLATE AGA/CSA
65	R8039-0980A	A	1 EA	LABEL, DANGER HIGH VOLTAGE
66	R960031	-	2 EA	LABEL, HAB ENCLOSURE
67	R99001A	A	1 EA	LABEL, CAUTION LABEL INSIDE GHAB ENCLOSURES

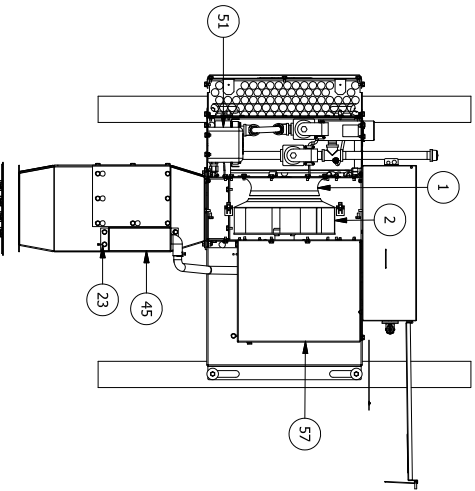
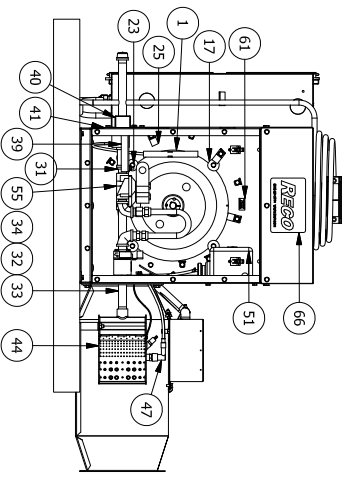
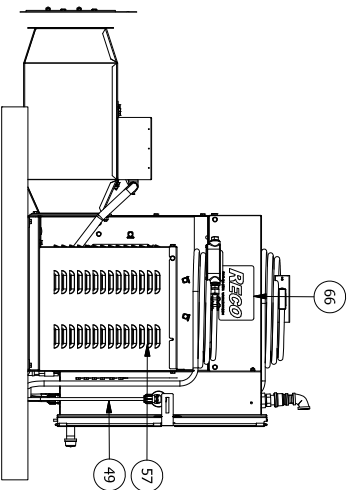
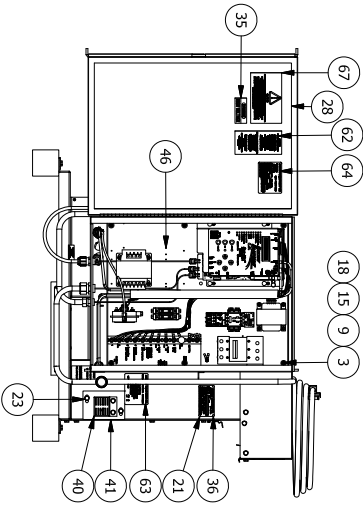


UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS - TOLERANCES ANGULAR - XX - 10:100 FRACTIONS - XX - DO NOT SCALE DRAWING		DATE CREATED: 3/5/2021	
BY: cwanderson		DRAWN: NA	
REVISIONS: SCALE: 1/10		DRAWING NO: 9518-5117G	
REV: B		SHEET: 1 OF 2	

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RAILWAY EQUIPMENT CO. MINNEAPOLIS, MINNESOTA (763) 972-2200	
TITLE: MAIN GHAB, 2HP, LOW PROFILE, LP, 460V, 3PH	
DWG NO: 9518-5117G	REV: G



NOTE: GAS LINE ASSEMBLY NOT ASSEMBLED, SHIP PARTS IN BAG



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MINNEAPOLIS, MINNESOTA (763) 978-2200

MINNEAPOLIS, MINNESOTA (763) 978-2200

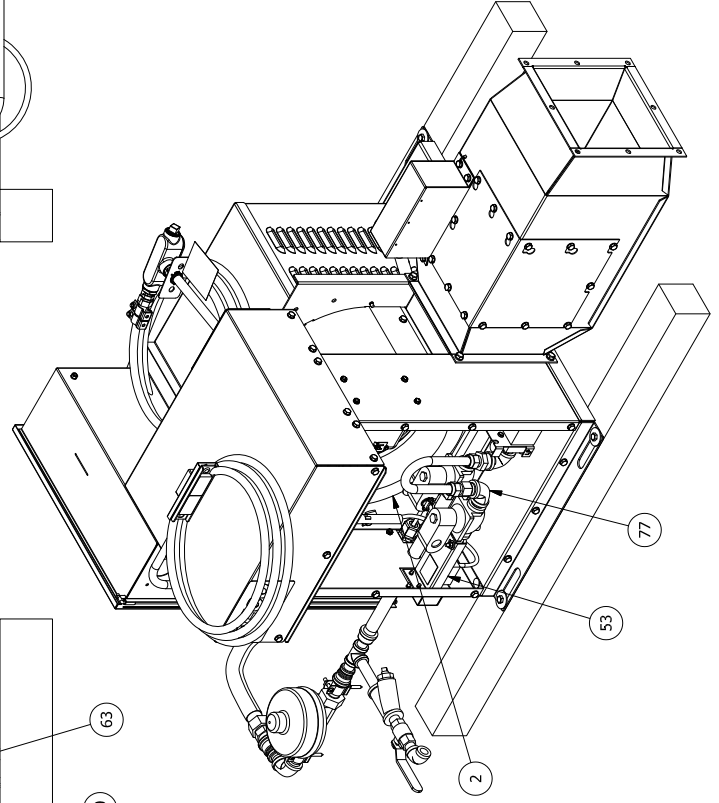
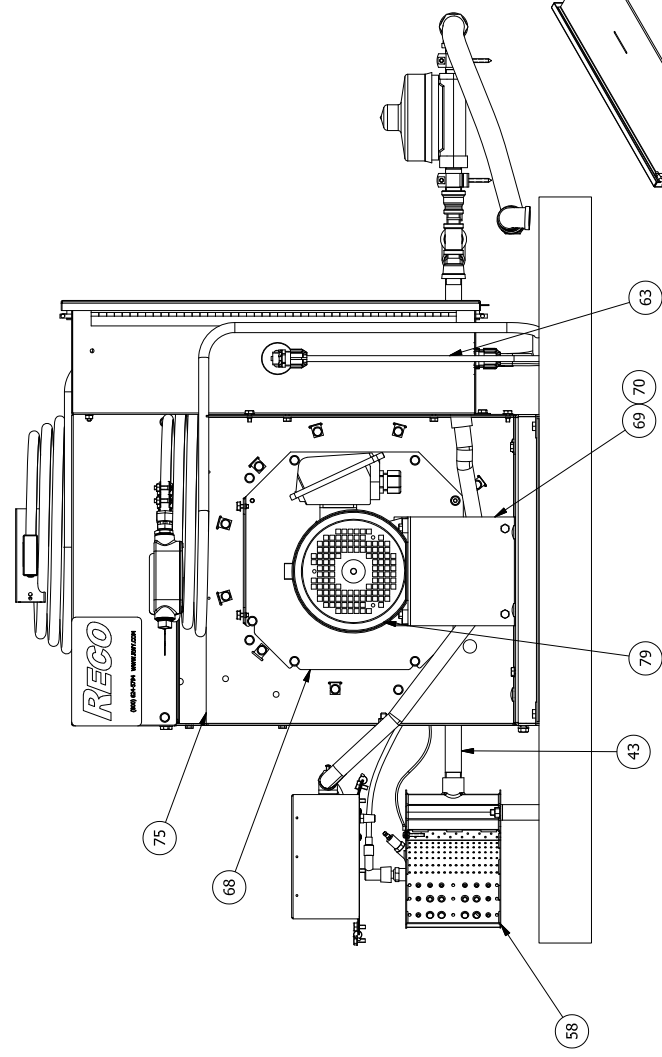
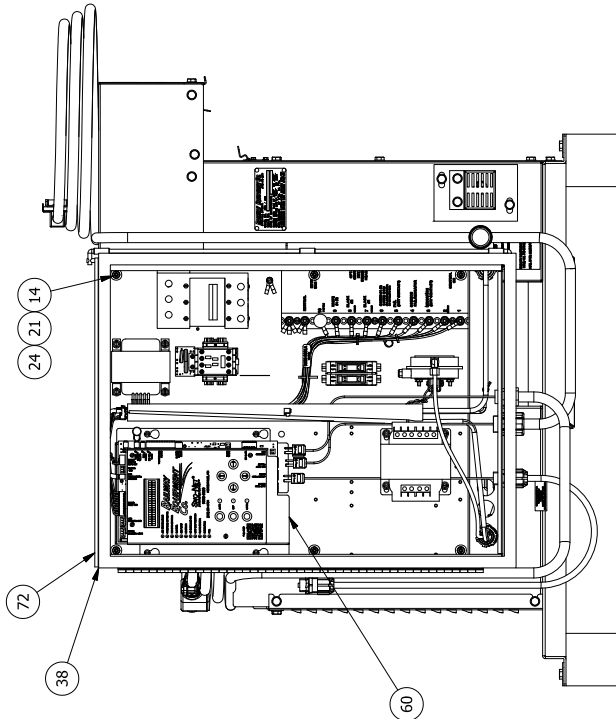
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MINNEAPOLIS, MINNESOTA (763) 978-2200

MINNEAPOLIS, MINNESOTA (763) 978-2200

MINNEAPOLIS, MINNESOTA (763) 978-2200

UNLESS OTHERWISE SPECIFIED		DIMENSIONS ARE IN INCHES	
DECIMALS		ANGULAR	
XX .0010		FRACTIONS	
XX .0010		XX NOT SCALE & DRAWING	
DATE CREATED		5/5/2021	
BY		Cw Anderson	
MATERIAL		NA	
REVISIONS		NA	
DRAWING NO.		9518-5117G	
SCALE		1/16" = 1" DIM. SIZE: B	
SHEET		2 OF 2	
REV:		G	
TITLE:		MAIN GAS HAR, 2HP, LOW PROFILE, LP, 460V, 3PH	



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS IN INCHES  
 DECIMALS TO THIRDS  
 ANGULAR TOLERANCES  
 .XX ±0.010 FRACTIONS  
 .X/D INDICATE SCALE DRAWING  
 DATE CREATED: 5/5/2021

BY: cwanderson  
 PART: NA  
 REVISION: NA

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**RAILWAY EQUIPMENT CO.**  
 MINNEAPOLIS, MINNESOTA (763) 972-2200

TITLE: MAIN GHAB, 2HP, LOW PROFILE, LP, 460V 3PH

DWG NO: 9518-5117G  
 SCALE: 1/8  
 SHEET: 3 OF 3

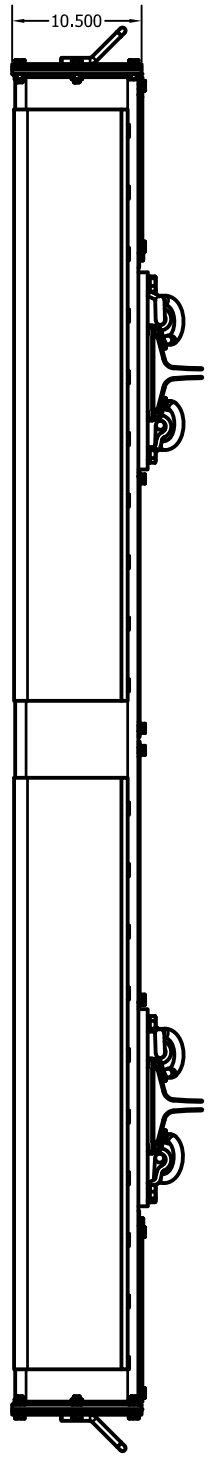
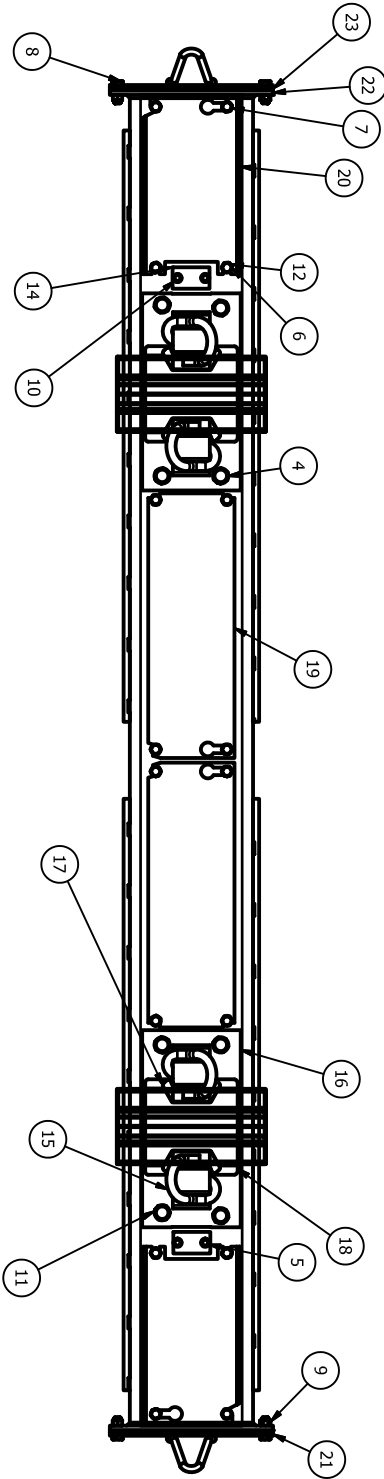
REV: G

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION	ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	12425	-	1080	IN	TAPE ROLL 2 INCH WIDE HEAVY	14	927237	A	2	EA	COVER PLATE, TEMP SENSOR
2	14150	-	1	EA	BAG, BURLAP 10" X 14" 100Z	15	927248	A	4	EA	RAIL CLIP, TIE DUCT
3	14151	-	1	EA	WIRE BURLAP BAG CLOSING TIES 6"	16	927355	B	2	EA	TIE PLATE 136# E-CLIP-PAD TYPE
4	28121	-	8	EA	BOLT, 3/4-10 X 1-1/2 HEX SS	17	927366	A	4	EA	E-CLIP INSULATOR
5	2831851114	-	4	EA	BOLT, 3/8-16 X 1 HEX HEAD, SS	18	927367	B	2	EA	PAD FOR E-CLIP RUBBER 136# TIE
6	2831951121	-	12	EA	BOLT, 1/2-13 X 1.25 HEX SS	19	927602	A	2	EA	COVER, POINT/TRACK NOZZLE
7	2831951123	-	4	EA	BOLT, 1/2-13 X 1.75 HEX SS	20	927603	A	2	EA	COVER, OUTSIDE TRACK NOZZLE
8	2831951124	-	12	EA	BOLT, 1/2-13 X 1-1/2 HEX HEAD	21	952572A	A	2	EA	COVER PLATE WITH LIFTING LUG 6-HOLE PATTERN
9	2832-9901	-	12	EA	NUT, 1/2-13 CENTERLOCK GRADE 5 ZINC	22	952573B	B	1	EA	ASSY, TIE DUCT QUICK CHANGE, 6-HOLE FLANGE
10	2833-8210	-	4	EA	WASHER, 3/8 SPLIT LOCK	23	952574A	A	2	EA	GASKET, TIE DUCT 6-HOLE PATTERN
11	2833-9009	-	8	EA	WASHER, 3/4 SPLIT LOCK	24	R8039-0904D	D	2	EA	CAUTION LABEL, TIE DUCT 136#
12	2833-9020	-	16	EA	WASHER, M12 SPLIT-LOCK	25	R8039-0914D	D	1	EA	TAG, ACCESS PARTS FOR TIE DUCT136#
13	60169	-	2	EA	TY-RAP, 0.30 X 8						

PARTS LIST

PARTS LIST

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	17-0017	NEW PART	1/22/2018	JT



**RAILWAY EQUIPMENT CO. 2017**

**RAILWAY EQUIPMENT CO.**  
*Manufacturing Innovation (781) 892-8888*

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 .XX 4 010" FRACTIONS  
 .XXX NOT SCALE DRAWING  
 DRAWN: TBERTOLDI  
 DATE: 1/24/2019  
 WDN: N/A  
 DWG NO: 9528-4815A  
 TIE DUCT, 136# QUICK CHANGE,  
 6-HOLE FLANGE  
 TITLE: 9528-4815A  
 SCALE: 1/10 DIMS: B SHEET 1 OF 1

REV	ECO #	DESCRIPTION	DATE	BY
A	17-0017	NEW PART	9/13/2018	TB

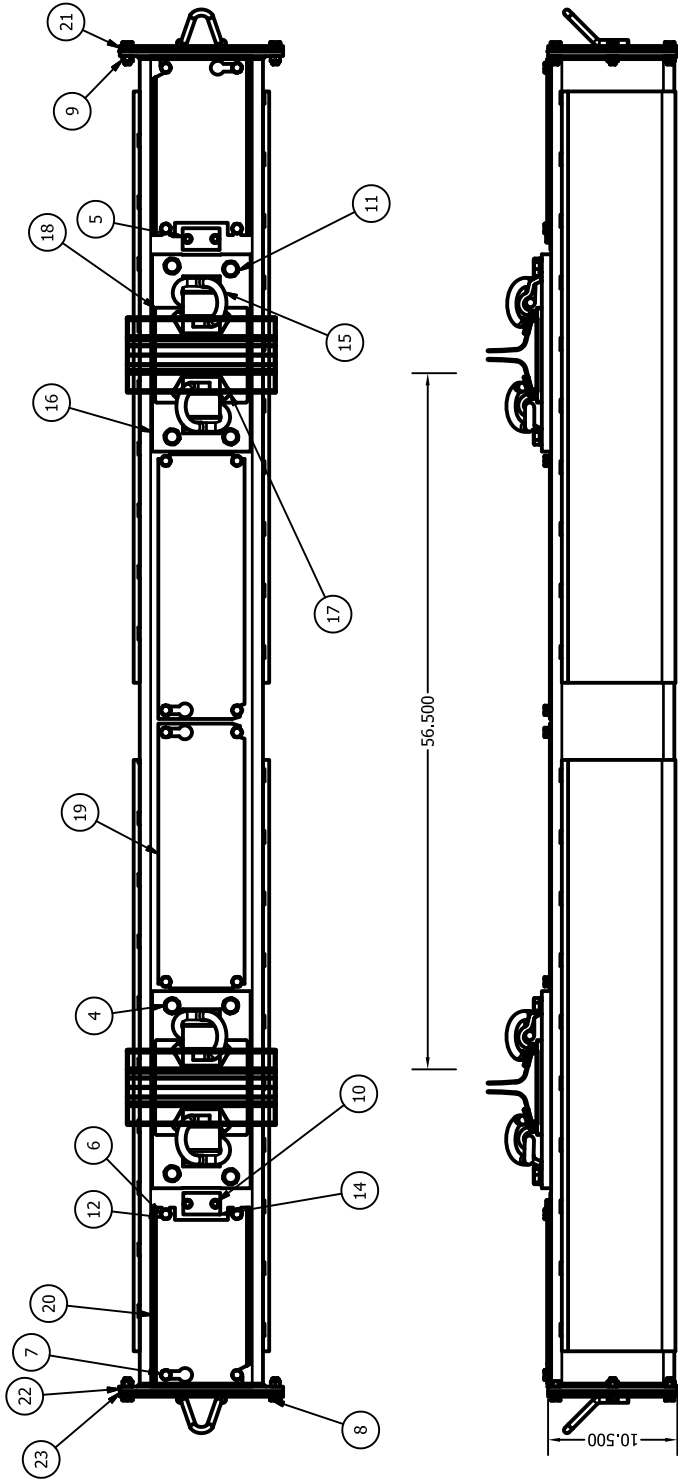
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	12425	-	1080	IN	TAPE ROLL 2 INCH WIDE HEAVY
2	14150	-	1	EA	BAG, BURLAP 10" X 14" 100Z
3	14151	-	1	EA	WIRE BURLAP BAG CLOSING TIES 6"
4	28121	-	8	EA	BOLT, 3/4-10 X 1-1/2 HEX SS
5	2831851114	-	4	EA	BOLT, 3/8-16 X 1 HEX HEAD, SS
6	2831951121	-	12	EA	BOLT, 1/2-13 X 1.25 HEX SS
7	2831951123	-	4	EA	BOLT, 1/2-13 X 1.75 HEX SS
8	2831951124	-	12	EA	BOLT, 1/2-13 X 1-1/2 HEX HEAD
9	2832-9901	-	12	EA	NUT, 1/2-13 CENTERLOCK GRADE 5 ZINC
10	2833-8210	-	4	EA	WASHER, 3/8 SPLIT LOCK
11	2833-9009	-	8	EA	WASHER, 3/4 SPLIT LOCK
12	2833-9020	-	16	EA	WASHER, M12 SPLIT-LOCK
13	60169	-	2	EA	TY-RAP, 0.30 X 8

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
14	927237	A	2	EA	COVER PLATE, TEMP SENSOR
15	927248	A	4	EA	RAIL CLIP, TIE DUCT
16	927356	B	2	EA	TIE PLATE 115# E-CLIP PAD TYPE
17	927366	A	4	EA	E-CLIP INSULATOR
18	927368B	B	2	EA	PAD FOR E-CLIP RUBBER 115# TIE
19	927602	A	2	EA	COVER, POINT/TRACK NOZZLE
20	927603	A	2	EA	COVER, OUTSIDE TRACK NOZZLE
21	952572A	A	2	EA	COVER PLATE WITH LIFTING LUG 6-HOLE PATTERN
22	952573B	B	1	EA	ASSY, TIE DUCT QUICK CHANGE, 6-HOLE FLANGE
23	952574A	A	2	EA	GASKET, TIE DUCT 6-HOLE PATTERN
24	R8039-0905D	D	2	EA	CAUTION LABEL, TIE DUCT 115#
25	R8039-0915D	D	1	EA	TAG, ACCESS PARTS FOR TIE DUCT 115#

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	12425	-	1080	IN	TAPE ROLL 2 INCH WIDE HEAVY
2	14150	-	1	EA	BAG, BURLAP 10" X 14" 100Z
3	14151	-	1	EA	WIRE BURLAP BAG CLOSING TIES 6"
4	28121	-	8	EA	BOLT, 3/4-10 X 1-1/2 HEX SS
5	2831851114	-	4	EA	BOLT, 3/8-16 X 1 HEX HEAD, SS
6	2831951121	-	12	EA	BOLT, 1/2-13 X 1.25 HEX SS
7	2831951123	-	4	EA	BOLT, 1/2-13 X 1.75 HEX SS
8	2831951124	-	12	EA	BOLT, 1/2-13 X 1-1/2 HEX HEAD
9	2832-9901	-	12	EA	NUT, 1/2-13 CENTERLOCK GRADE 5 ZINC
10	2833-8210	-	4	EA	WASHER, 3/8 SPLIT LOCK
11	2833-9009	-	8	EA	WASHER, 3/4 SPLIT LOCK
12	2833-9020	-	16	EA	WASHER, M12 SPLIT-LOCK
13	60169	-	2	EA	TY-RAP, 0.30 X 8

PARTS LIST					
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	17-0017	NEW PART	9/13/2018	TB



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS - ANGULAR  
FRACTIONS - DIMENSIONS  
- XX, 4, 0/16" - DIMENSIONS  
- DO NOT SCALE DRAWING

DRAWN: TBERTOLDI  
DATE: 1/24/2019  
SCALE: 1/10  
SHEET: B  
SHEET 1 OF 1

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**RAILWAY EQUIPMENT CO.**  
RAILWAY EQUIPMENT CO.  
TIE DUCT, 115# QUICK CHANGE,  
6-HOLE FLANGE

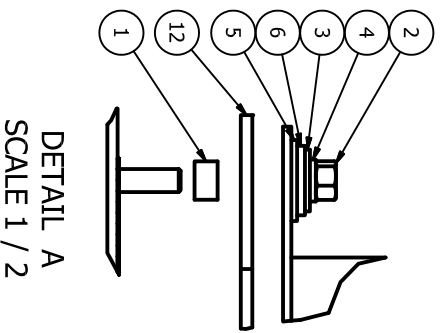
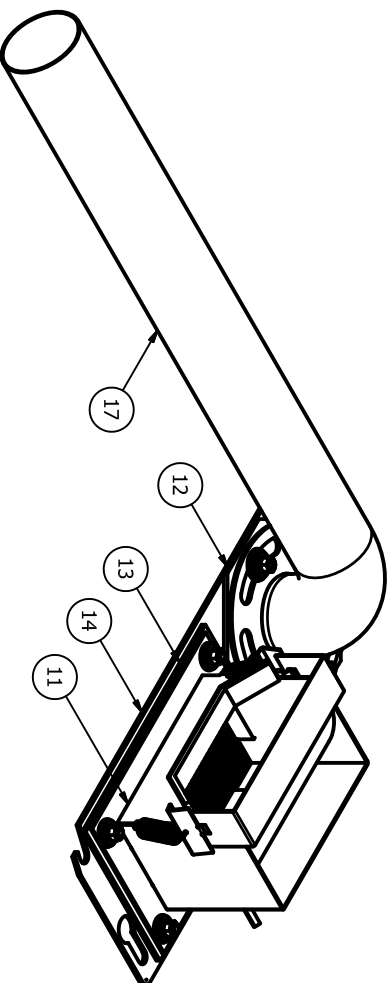
DWG NO: 9528-4615A  
REV: A  
PARTS LIST: N/A  
SCALE: 1/10  
SHEET: B  
SHEET 1 OF 1

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	28106	-	8	EA	SPACER, .38X.625X.375 ROUND
2	2832-8101	-	8	EA	NUT, 3/8-16 HEX
3	2833-8110	-	8	EA	WASHER, 3/8 FLAT
4	2833-8210	-	8	EA	WASHER, 3/8 SPLIT LOCK
5	2833-9014	-	4	EA	WASHER, 5/8 FLAT SAE
6	2833-9015	B	8	EA	WASHER, ISOLATING NOZZLE
7	60195	-	2	FT	GASKET, .25 X 1.0 ADHESIVE BK
8	92742	-	2	EA	SPRING, TRACK DUCT SUPPORT
9	92743	B	2	EA	CLIP, HOLDDOWN SPRING
10	92745	A	1	EA	HOLDDOWN STRAP, T. DUCT
11	927488	A	1	EA	NOZZLE, TRACK DUCT, NO DAMPER
12	92757	D	1	EA	GASKET, ISO, PT NOZZLE RED
13	92759	B	1	EA	GASKET, ISO, TR NOZZLE RED
14	927600	B	1	EA	POINT/TD NOZZLE MOUNT PLATE RH
15	927701	A	1	EA	SCREEN, POINT NOZZLE
16	927702	A	1	EA	SCREEN TRACK DUCT NOZZLE LARGE
17	936171A	A	1	EA	POINT NOZZLE, ROUND GALV
18	R9508-4000B	B	1	EA	LABEL, QUICK NOZZLE ASSY RH

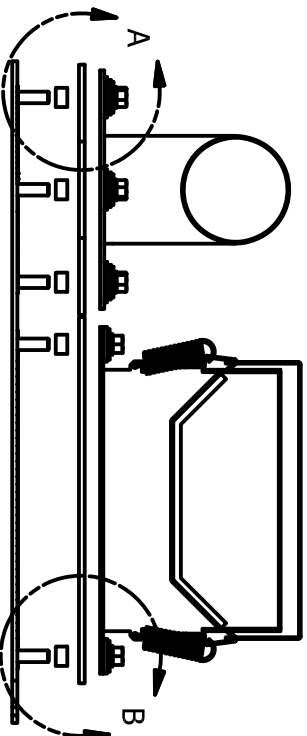
PARTS LIST

REV	ECO #	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/19/2006	WS
B	18-0011	ROUND POINT NOZZLE	10/23/2018	TB

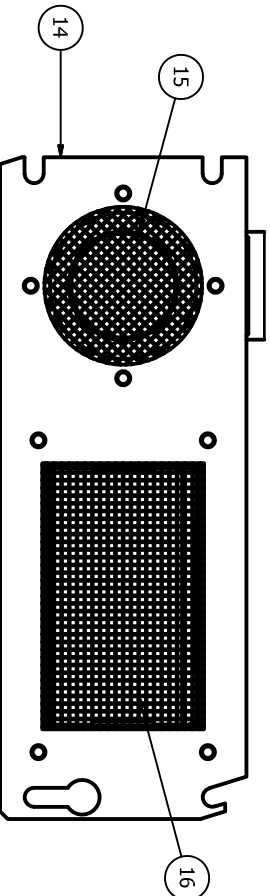
REVISION HISTORY



DETAIL A  
SCALE 1 / 2



DETAIL B  
SCALE 1 / 2



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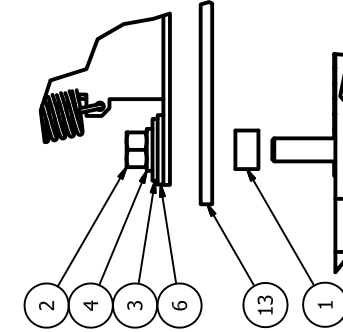
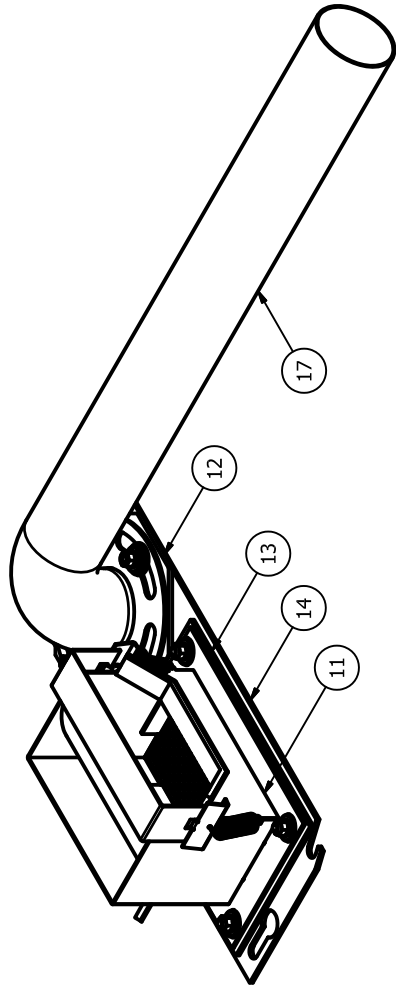
**RAILWAY EQUIPMENT CO.**  
*Manufacturing Excellence*  
 (781) 886-6600

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 .XX & .010" FRACTIONS  
 .XX0 .001" SCALE DRAWINGS

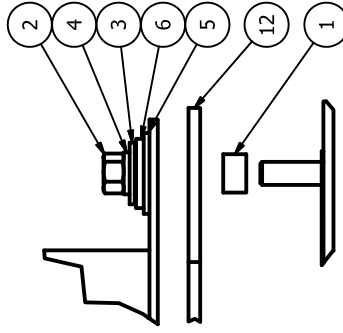
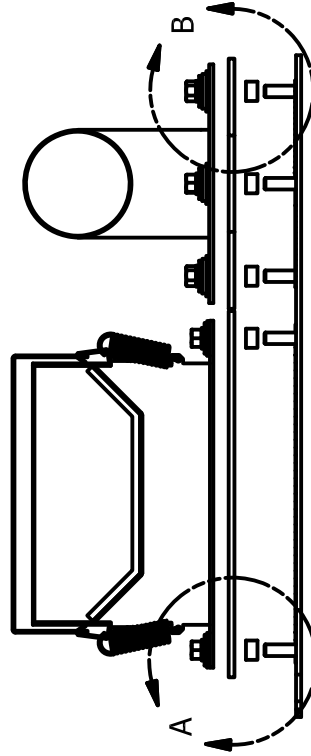
DATE: 10/23/2018  
 BY: TBERTOLDI  
 TITLE: POINT/TRACK NOZZLE ASSY RH  
 PART NO: 9508-4000B  
 REV: B  
 SCALE: 1/5 DRAWING: B SHEET 1 OF 1

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	06-0024	NEW PART	10/19/2006	WS
B	18-0011	ROUND POINT NOZZLE	10/23/2018	TB

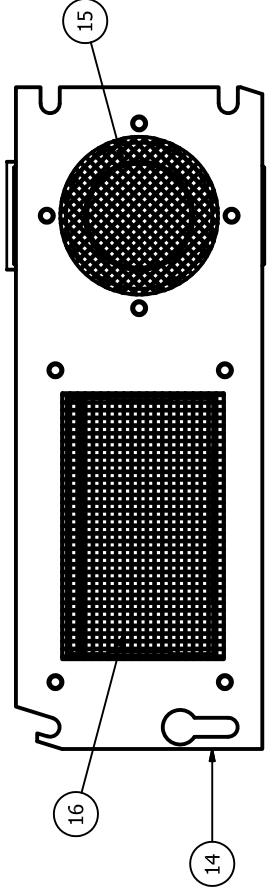
PARTS LIST					
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	28106	-	8	EA	SPACER, .38X.625X.375 ROUND
2	2832-8101	-	8	EA	NUT, 3/8-16 HEX
3	2833-8110	-	8	EA	WASHER, 3/8 FLAT
4	2833-8210	-	8	EA	WASHER, 3/8 SPLIT LOCK
5	2833-9014	-	4	EA	WASHER, 5/8 FLAT SAE
6	2833-9015	B	8	EA	WASHER, ISOLATING NOZZLE
7	60195	-	2	FT	GASKET, .25 X 1.0 ADHESIVE BK
8	92742	-	2	EA	SPRING, TRACK DUCT SUPPORT
9	92743	B	2	EA	CLIP, HOLDDOWN SPRING
10	92745	A	1	EA	HOLDDOWN STRAP, T. DUCT
11	927488	A	1	EA	NOZZLE, TRACK DUCT, NO DAMPER
12	92757	D	1	EA	GASKET, ISO, PT NOZZLE RED
13	92759	B	1	EA	GASKET, ISO, TR NOZZLE RED
14	927606	B	1	EA	POINT/TD NOZZLE MOUNT PLATE LH
15	927701	A	1	EA	SCREEN, POINT NOZZLE
16	927702	A	1	EA	SCREEN TRACK DUCT NOZZLE LARGE
17	936171A	A	1	EA	POINT NOZZLE, ROUND GALV
18	R9508-4001B	B	1	EA	LABEL, QUICK NOZZLE ASSY LH



DETAIL A  
SCALE 1 / 2



DETAIL B  
SCALE 1 / 2



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS IN INCHES  
DIMENSIONS IN PARENTHESIS ARE ANGULAR  
DECIMALS: .XX ±.010" FRACTIONS: 1/16" ±.005"  
.XX ±.010" FRACTIONS: 1/16" ±.005"  
TOLERANCE: ±.005"  
TOLERANCE: ±.005"  
TOLERANCE: ±.005"  
TOLERANCE: ±.005"

DATE: 10/23/2018  
BY: TBERSTOLDI

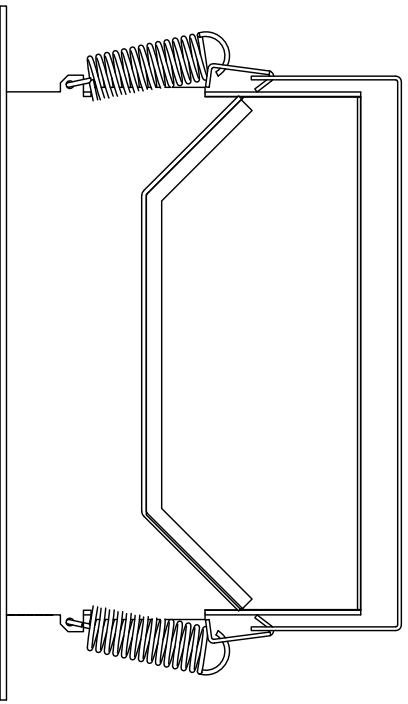
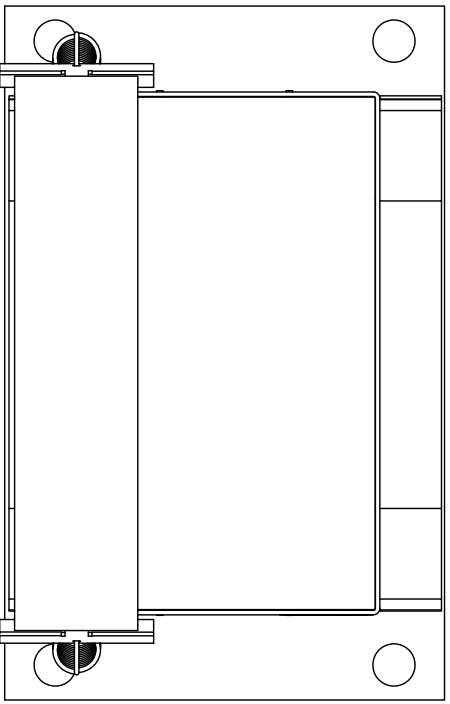
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**RAILWAY EQUIPMENT CO.**  
RAILWAY EQUIPMENT CO.  
RAILWAY EQUIPMENT CO.

POINT/TRACK NOZZLE ASSY LH

SCALE: 1/5 DRAWING: 9508-4001B SHEET: 1 OF 1

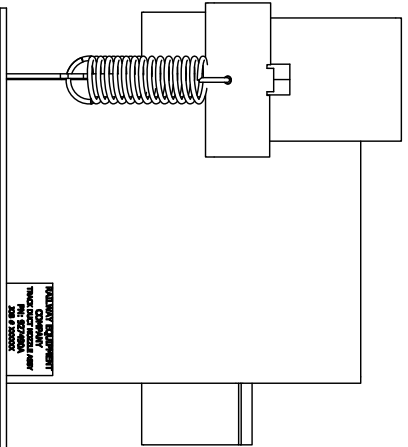
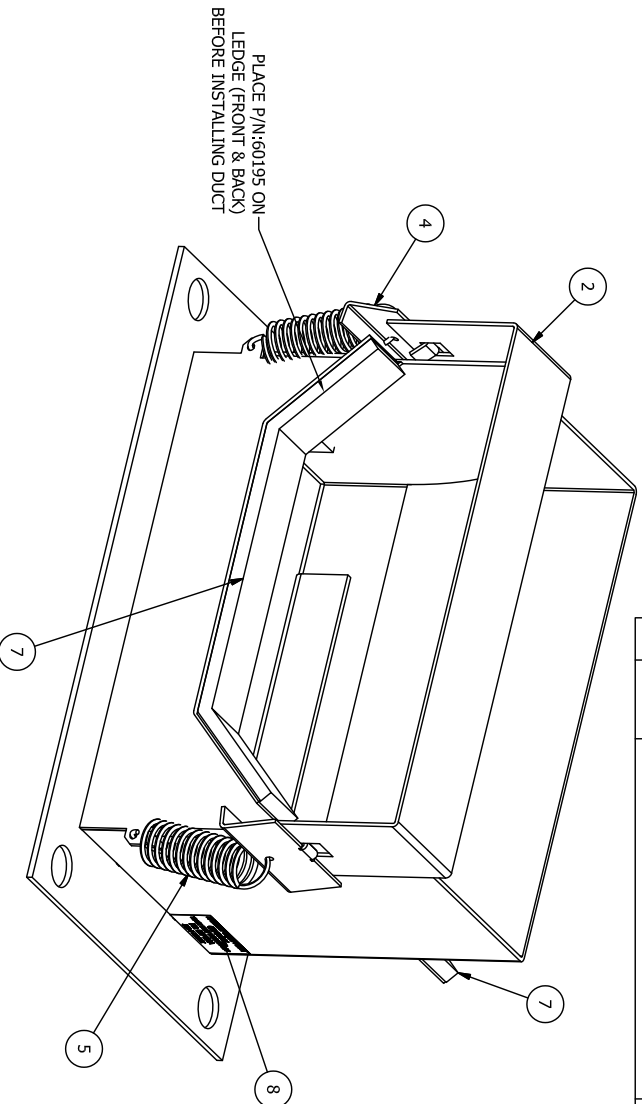
ITEM	PART NUMBER	QTY	DESCRIPTION
1	927488	A	EA 1 NOZZLE, TRACK DUCT NO DAMPER
2	92745	A	EA 1 HOLDOWN STRAP, T. DUCT
5	92742	-	EA 2 SPRING, TRACK DUCT SUPPORT
4	92743	B	EA 2 CLIP, HOLDOWN SPRING
7	60195	-	FT 1.67 GASKET, .25 X 1.0 ADHESIVE BK
8	R927490A	EA	EA 1 LABEL, ID

Parts List



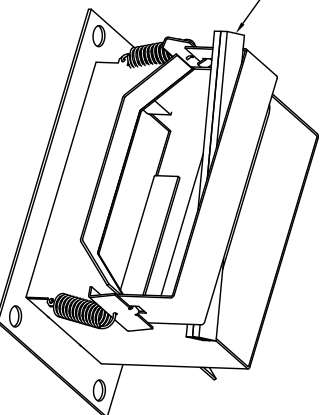
REV	ECO	DESCRIPTION	DATE	BY
A	06-0028	NEW PART	11/30/2006	RMJ

REVISION HISTORY



PLACE P/N:60195 UNDER STRAP FOR TRANSPORTATION.

PACKOUT VIEW  
SCALE 1 / 4



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**RAILWAY EQUIPMENT CO.**  
DELAWARE, KENTWOOD (781) 972-4900

TITLE: NOZZLE, TRACK DUCT ASSY

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS .0005 ANGIULAR  
X.X 4 0.02 FRACTIONS  
3/16 3/16 3/16 3/16  
DRAWN: RMJ

DATE: 11/30/06

WRT: N/A

ENG: N/A

SCALE: 1/2

DWG NO: 927490

DESIGN: B

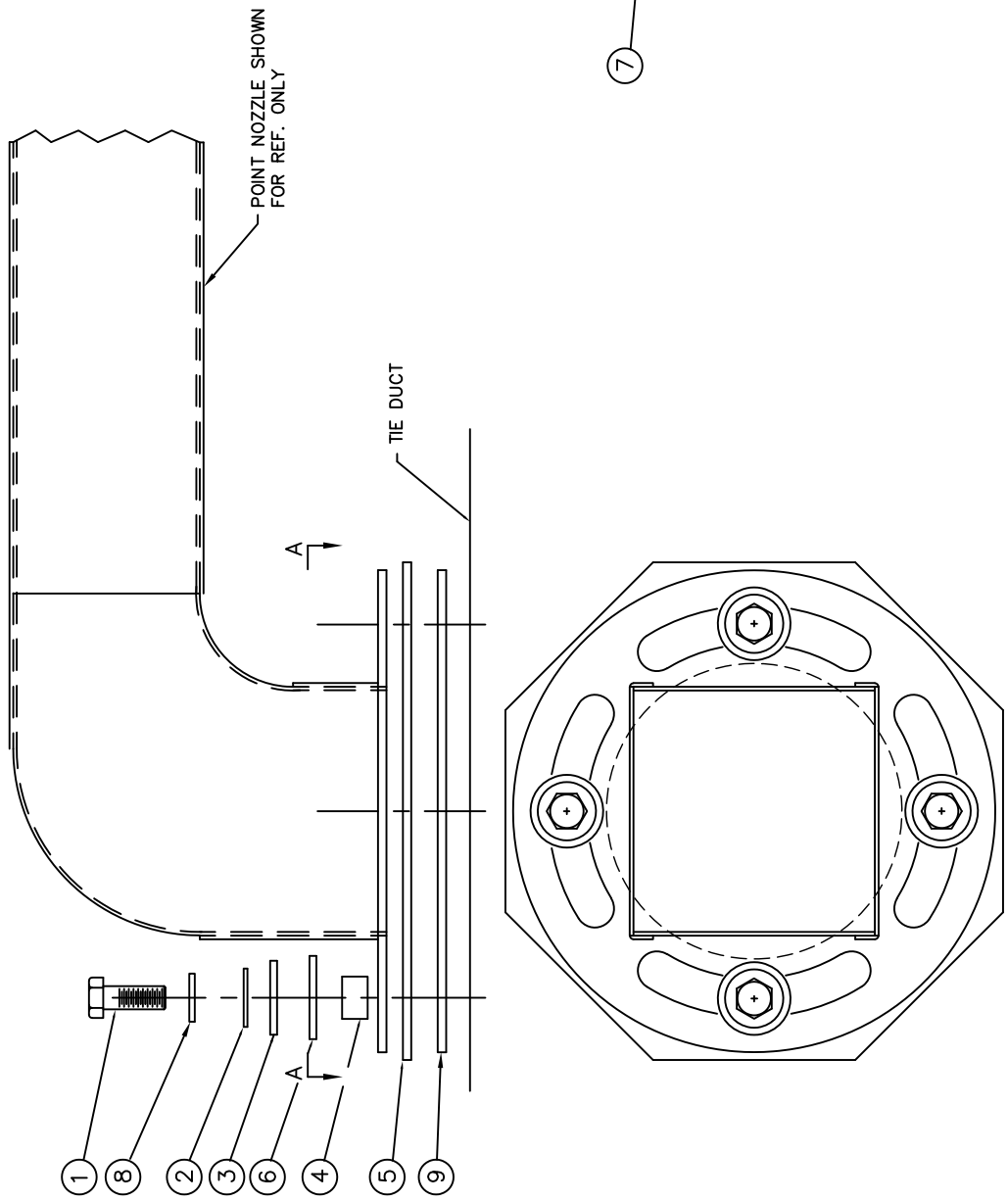
SHEET 1 OF 1

REV: A



REV.	Q.C.A.	BY	REVISION DESCRIPTION	DATE	APPROVED
B		TB	ADD 927701	10/19/00	---
C	08-002B	RJ	CORNERS CUT OFF ON DUCT	11/28/06	---

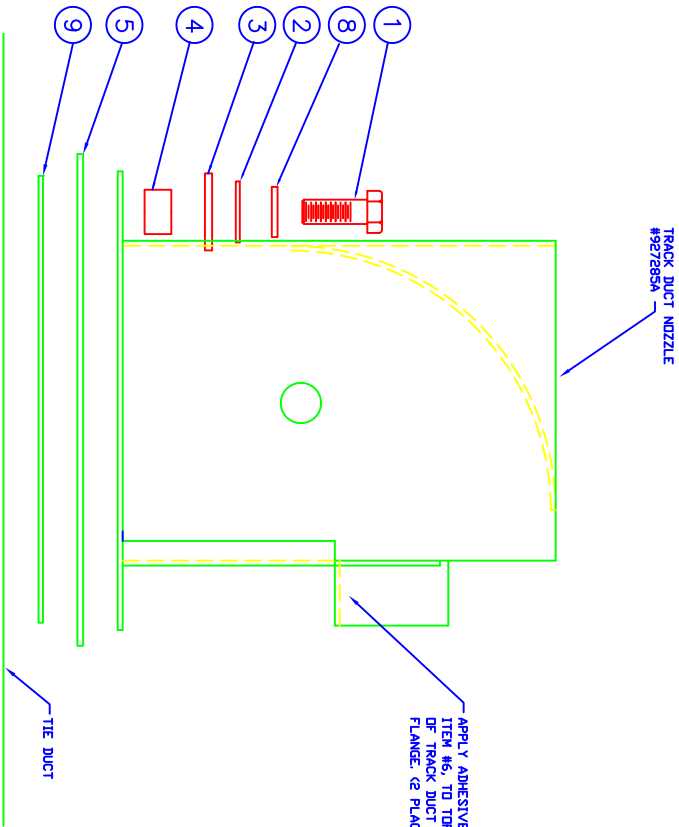
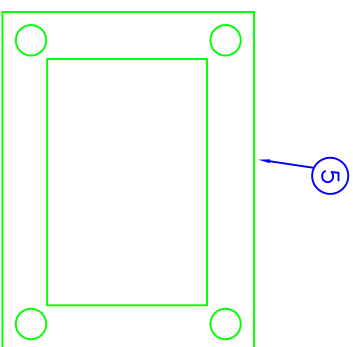
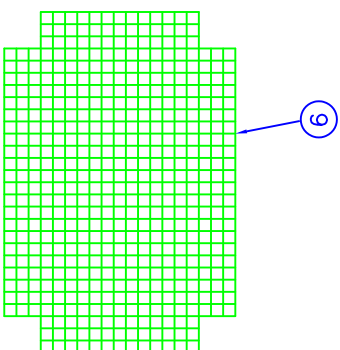
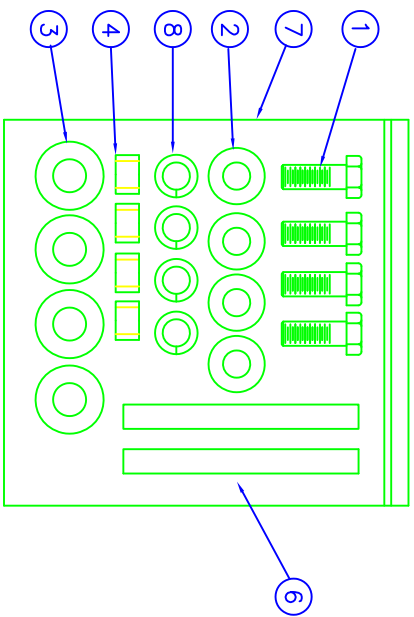
ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	2631851114	EA	4	BOLT, HEX HD 3/8-16 x 1" SS
2	2633-8110	EA	4	WASHER, PLAIN 3/8"
3	2633-9015B	EA	4	WASHER, INSULATOR
4	28106	EA	4	SPACER, ROUND, .38 X .625 X .375
5	92757D	EA	1	GASKET, POINT NOZZLE
6	2633-9014	EA	4	WASHER, 5/8 FLAT PLATED
7	14046	EA	1	BAG, ZIPTOP 9x12 4mil
8	2633-9210	EA	4	WASHER, SPLIT LOCK 3/8"
9	927701A	EA	1	SCREEN, POINT NOZZLE



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**RAILWAY EQUIPMENT CO.**  
 DELANO, MINNESOTA (763) 972-3300

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES FRACTIONS ARE TO BE USED DECIMALS TO TWO PLACES DIMENSIONS TO BE SHOWN DO NOT SCALE DRAWING	TITLE ISOLATION KIT ASSEMBLY POINT NOZZLE TIE DUCT
DRAWN EFK	DATE 04/11/97
MATERIAL N/A	REV C
TIE & WELD ALLOWANCE N/A	SCALE 1/4" DRAWING SIZE
PWF NO. 9278-0021	SHEET 1 OF 1

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	283185114	EA	4	BOLT, HEX, 3/8-16 x 1" SS
2	2833-810	EA	4	WASHER, FLAIN 3/8
3	2833-9015	EA	4	WASHER, INSULATOR
4	28106	EA	4	SPACER, ROUND, .36 X .625 X .375
5	92739	EA	1	GASKET, TRACK DUCT NOZZLE
6	60195	FT	1.67	GASKET, ADHESIVE, .25 X 1"
7	14045	EA	1	BAG, ZIPTOP 12 X 13 4ml
8	2833-8210	EA	4	WASHER, SPLIT LOCK 3/8
9	927702	EA	1	SCREENING, ISO KIT, TRACK NOZZLE
10	R9278-0027A	EA	1	DRAINING, ISO KIT, TRACK NOZZLE
11	R92780027A	EA	1	LABEL, BAG LABEL ISO KIT TRACK



APPLY ADHESIVE GASKET  
ITEM #6, TO TOP SURFACES  
OF TRACK DUCT NOZZLE  
FLANGE (2 PLACES)

TRACK DUCT NOZZLE  
#92785A

TIE DUCT

REV	SCALE	BY	DATE	APPROVED
A	80%	TB	NEW PART	12/29/00

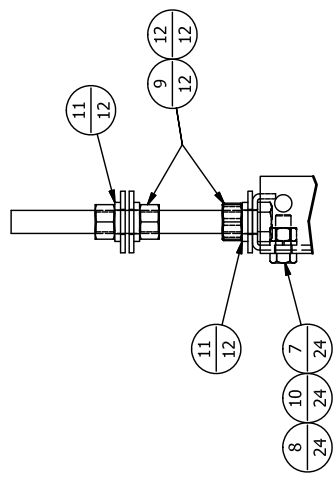
FORMED MATERIAL	DATE	APPROVED BY	DATE
FOR INSULATION PURPOSES ONLY. DO NOT USE FOR OTHER PURPOSES.	12/19/00	T. BUHL	
APPROVED BY	DATE	APPROVED BY	DATE

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**RAILWAY EQUIPMENT CO.**  
 BAZZANO, MISSOURI (781) 675-8800  
 ASSY, ISO KIT  
 TRACK NOZZLE  
 TIE DUCT  
 9278-0027

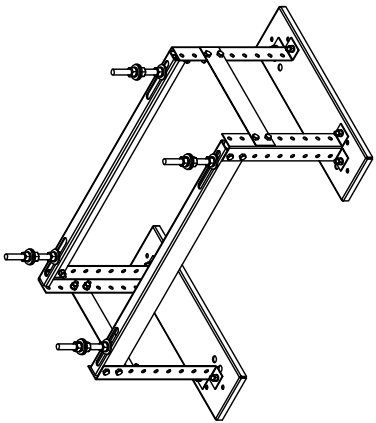
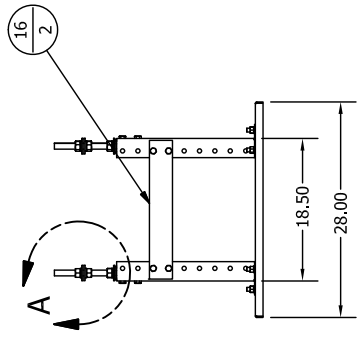
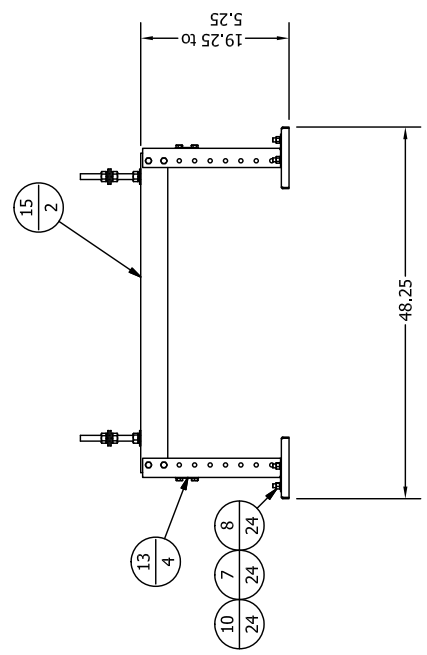
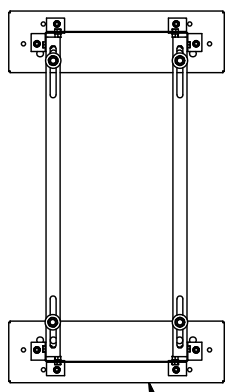
REV	ECO	DESCRIPTION	DATE	BY
A	06-0028	NEW PART	10/9/2006	WS
-	-	THINNER SHEET METAL	2/17/2020	JT

PARTS LIST					
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	12425	-	IN	324	TAPE ROLL 2 INCH WIDE HEAVY
2	14046	-	EA	1	BAG, 9 X 12 4MIL ZIPTOP
3	14150	-	EA	1	BAG, BURLAP, 10" X 14"-100Z
4	14151	-	EA	1	WIRE BURLAPBAG CLOSING TIES 6"
5	14153	-	EA	1	BAG, WOVEN YELLOW 23.5 X 48
6	2831-9511	-	EA	4	BOLT, 3/4-10 X 8 HEX TAP
7	2831951120	-	EA	24	BOLT, 1/2-13 X 1-1/4 HEX HEAD
8	2832-9002	-	EA	24	NUT, 1/2-13 HEX
9	2832-9102	-	EA	12	NUT, 3/4-10 HEX
10	2833-9002	-	EA	24	WASHER, 1/2 SPLIT LOCK
11	2833-9009	-	EA	12	WASHER, 3/4 SPLIT LOCK
12	2833-9010	-	EA	12	WASHER, 3/4 FLAT
13	92852B	B	EA	4	UPRIGHT LEG SHORT FOUNDATION
14	92855B	B	EA	2	BASE FOUNDATION
15	92857C	C	EA	2	TOP 2HP FOUNDATION
16	92860B	B	EA	2	FOUNDATION SUPPORT BRACE SMALL
17	R9288-0200A	A	EA	1	INSTRUCT SHEET 2 HP FOUNDATION
18	R9288-0202A	A	EA	1	LABEL, FOUNDATION ASSY 2 HP TAG LABEL

REVISION HISTORY				
REV	ECO	DESCRIPTION	DATE	BY
A	06-0028	NEW PART	10/9/2006	WS
-	-	THINNER SHEET METAL	2/17/2020	JT



DETAIL A  
SCALE 1/4



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS - FRACTIONS  
.XX, .XX, .XX FRACTIONS  
XXX.XXX SCALE DRAWING  
DRAWN: JT

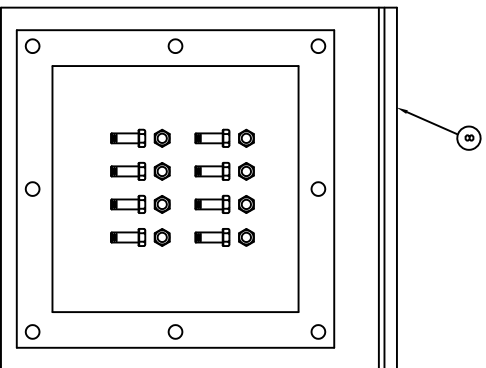
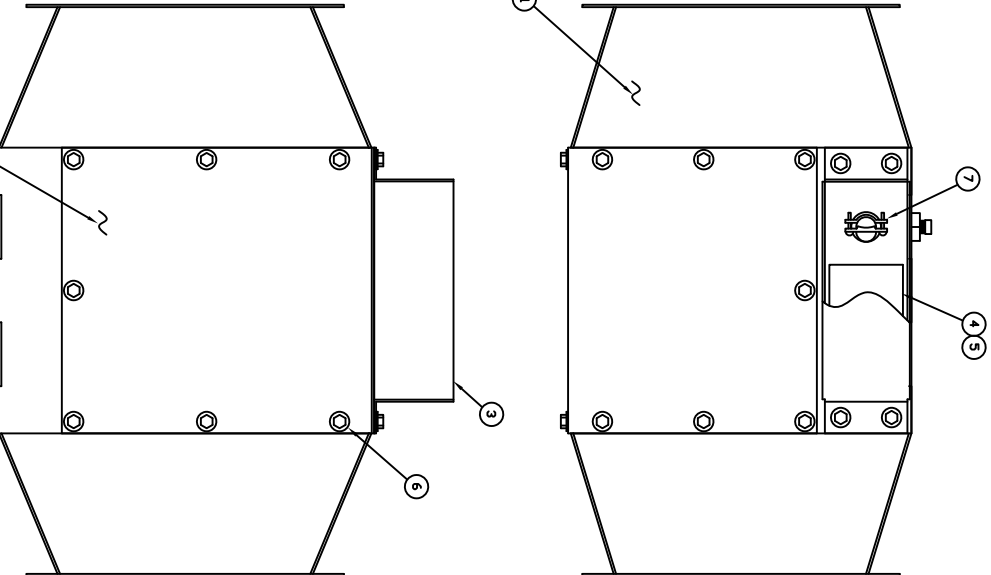
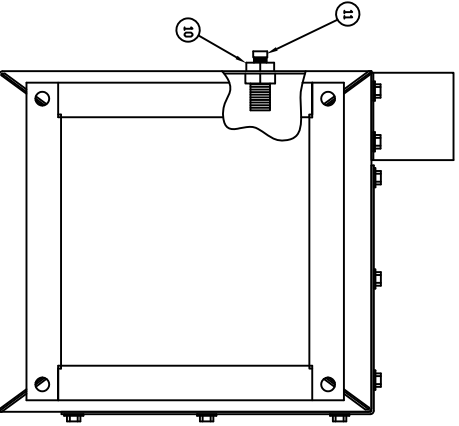
© RAILWAY EQUIPMENT CO. 2020  
**RAILWAY EQUIPMENT CO.**  
DELAWARE, MINNESOTA (763) 972-5800

TITLE: FOUNDATION ASSY 2HP HAB BOLTED (ASSEMBLY)

DATE: 2/17/2020  
DWG NO: 9288-0202A  
REV: A

SCALE: 1/16  
DWS SIZE: B  
SHEET 1 OF 1

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	950815	EA	1	WELDT, 1.5' FLAME DUCT, MAXON
2	950816	EA	1	CORNER, FLANGE THK, MAXON
3	950817	EA	1	CORNER, FLANGE THK, MAXON
4	950818	EA	1	CORNER, FLANGE THK, MAXON
5	950819	EA	1	CORNER, FLANGE THK, MAXON
6	28311104	EA	1	AIR FLOW SWITCH, 950/951/960
7	29002	EA	2	SCREW, 8-32 X 1/2 PAN, SLOTT
8	60002	EA	16	BOLT, 1/2-20 X 1/2 PAN, SLOTT
9	9273-0026	EA	2	3/8" TONEX REGAL, 6823
10	6093-0102	EA	1	ASSSEMBLY, 8' X8' DUCT, BOLT KIT
11	61083	EA	1	TY-BRAP
		EA	1	BULWHEAD
		EA	1	BRASS PLUG



REV	ECN	REV	REVISION DESCRIPTION	DATE	APPROVED
A	03-0012	RF	NEW PART	03/21/03	----
B	03-0025	RF	CHG FLANGE THK.	08/12/03	----
C	04-0029	RF	BOLT, TOGETHER MODEL	05/21/05	----

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS SHALL BE IN INCHES  
DIMENSIONS SHALL BE IN MILLIMETERS  
DIMENSIONS SHALL BE IN METERS  
DIMENSIONS SHALL BE IN FEET  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS  
DIMENSIONS SHALL BE IN KILOMETERS

DRAWN: RPF  
DATE: 03/21/03  
MATERIAL: N/A  
SCALE: N/A

TITLE: FLAME DUCT  
8" X 8" X 1.5"  
(ASSEMBLY / B.O.M.)

DWG NO.: 9508-3415  
SCALE: 1/4" = 1"  
DRAWING SIZE: B  
SHEET: 1 OF 1  
REV: C

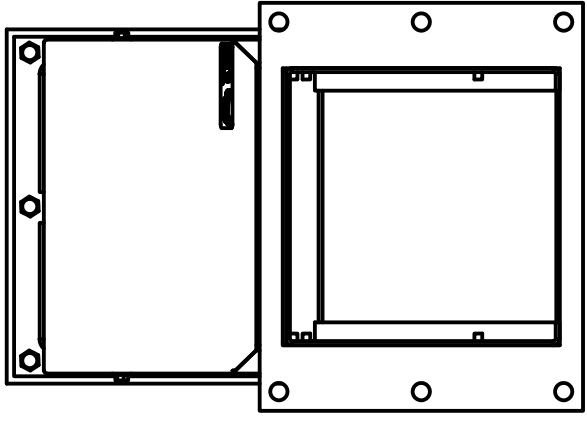
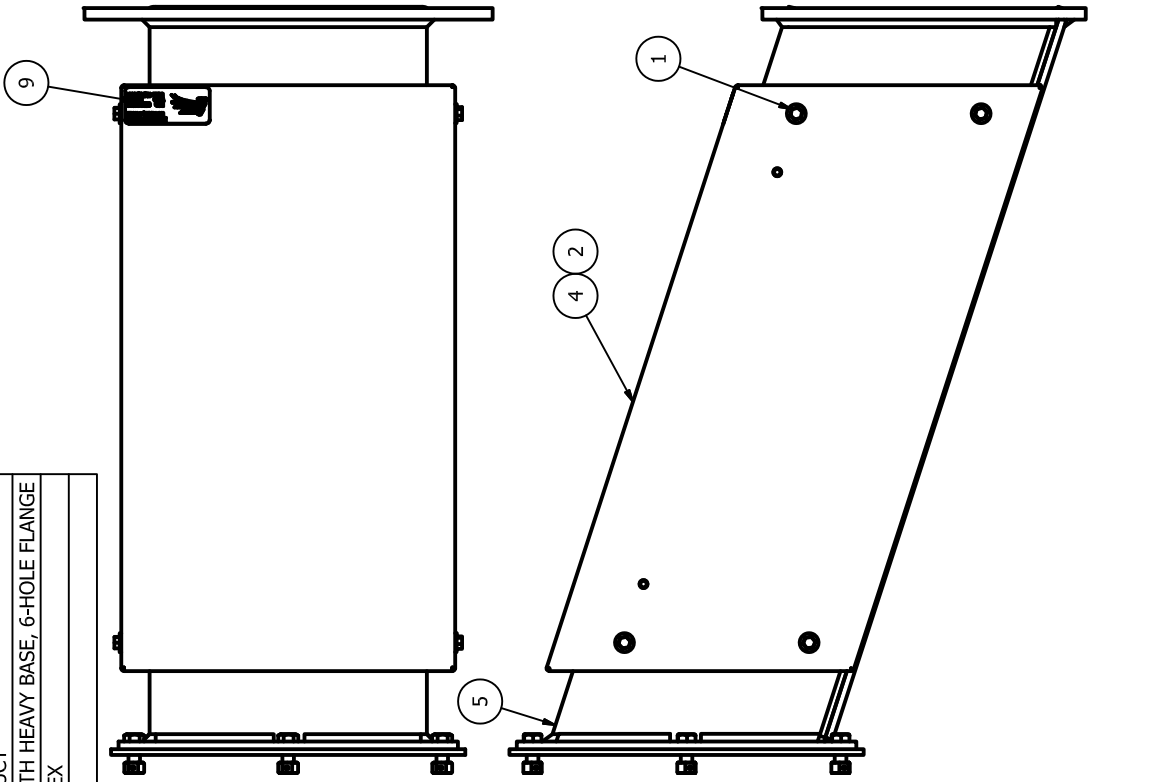
© RAILWAY EQUIPMENT CO. 2003-2005  
RAILWAY EQUIPMENT CO.  
DARIANO, MINNESOTA (763) 972-2800

PARTS LIST

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	29019	-	8	EA	BOLT, 1/4-20 X 1.3 SHOULDER THREAD ROLLING
2	32002	A	6	SQFT	INSULATION, FIBERGLASS
3	6093-0102	-	1	EA	TY-RAP
4	952226C	C	1	EA	INSUL COVER, OFFSET DUCT
5	952580A	A	1	EA	WELDMENT, OFFSET, WITH HEAVY BASE, 6-HOLE FLANGE
8	9528-0074D	D	1	EA	GASKET KIT, 9X9 5HP FLEX
9	R9528-3410A	A	1	EA	LABEL, ID

REVISION HISTORY

REV	ECO #	DESCRIPTION	DATE	BY
A	17-0017	NEW PART	7/7/2017	BJM



VIEW A-A  
SCALE 1 / 4

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS - THIRDS  
.XX - 3/16 FRACTIONS  
XXX - NOT SCALE DRAWING

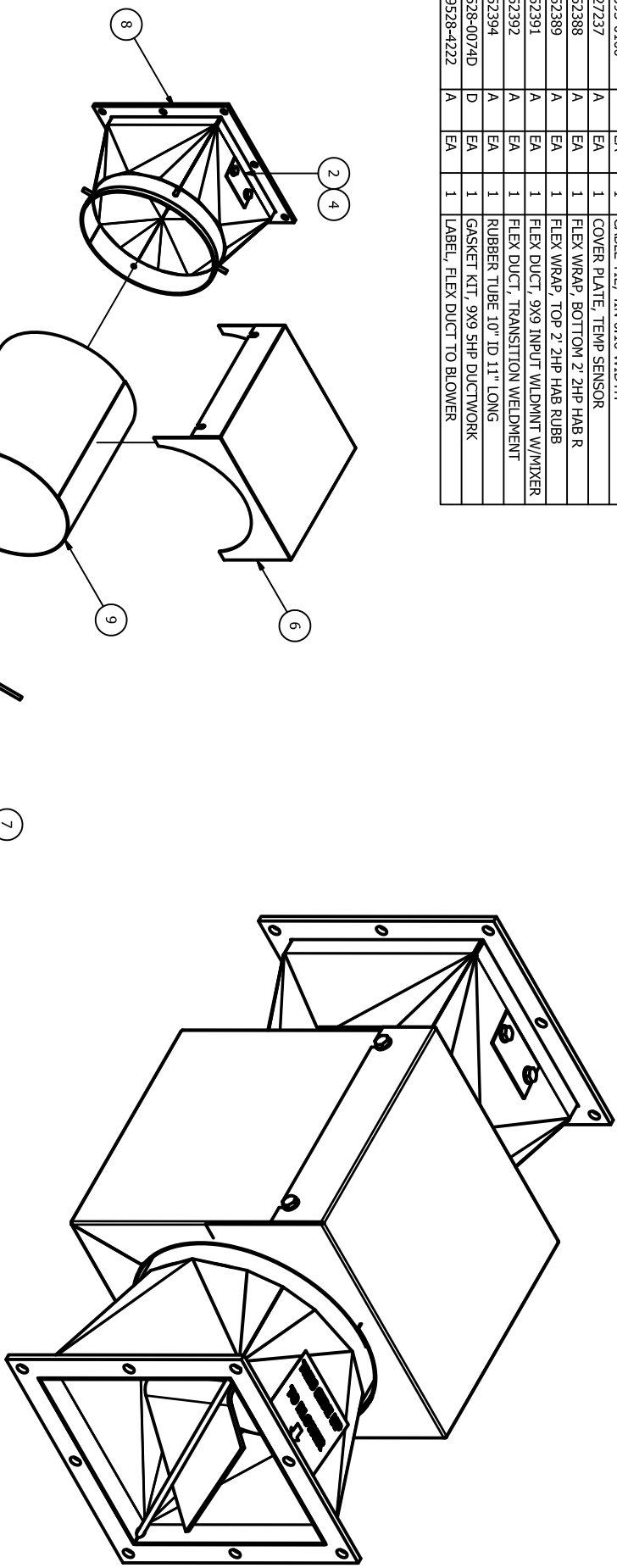
© RAILWAY EQUIPMENT CO. 2017  
**RAILWAY EQUIPMENT CO.**  
ANN ARBOR, MICHIGAN (734) 667-8899

TITLE: DUCT, OFFSET, 2' HD NO MIXER, 6-HOLE FLANGE  
DRAWN: BMOULTON  
DATE: 7/7/2017  
DWG NO: 9528-3410A  
SCALE: 1/4  
SHEET: 1 OF 1

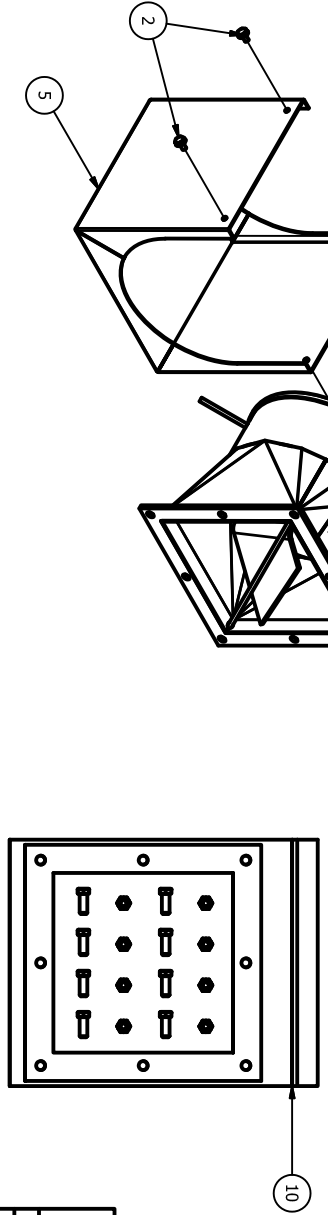
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	28105	-	EA	2	CLAMP, HOSE SST 1.8 INCH
2	29051	-	EA	6	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
3	6093-0100	-	EA	1	CABLE TIE, 4IN 0.10 WIDTH
4	927237	A	EA	1	COVER PLATE, TEMP SENSOR
5	952388	A	EA	1	FLEX WRAP, BOTTOM 2 2HP HAB R
6	952389	A	EA	1	FLEX WRAP, TOP 2 2HP HAB RUBB
7	952391	A	EA	1	FLEX DUCT, 9X9 INPUT WLDMNT W/MIXER
8	952392	A	EA	1	FLEX DUCT, TRANSITION WELDMENT
9	952394	A	EA	1	RUBBER TUBE 10" ID 11" LONG
10	9528-0074D	D	EA	1	GASKET KIT, 9X9 5HP DUCTWORK
11	R9528-4222	A	EA	1	LABEL, FLEX DUCT TO BLOWER

PARTS LIST

REV	ECO #	DESCRIPTION	DATE	BY
A	08-0003	NEW PART	6/23/10	ES



USE CLAMPS (P/N 28105) TO ATTACH RUBBER TUBE TO WELDMENTS.



**RAILWAY EQUIPMENT CO. 2008**

**RAILWAY EQUIPMENT CO.**  
*Manufacturing Division* (703) 992-2000

**TITLE:** FLEX DUCT 2-ST INS W/MIXER  
 9 X 9 RED RUBBER  
 (ASSEMBLY / B. O. M.)

**DATE:** 9/21/2018  
**DATE:** 9/21/2018  
**DATE:** 9/21/2018

**DESIGNER:** TBERTOLDI  
**DATE:** 9/21/2018

**DATE:** N/A  
**DATE:** N/A

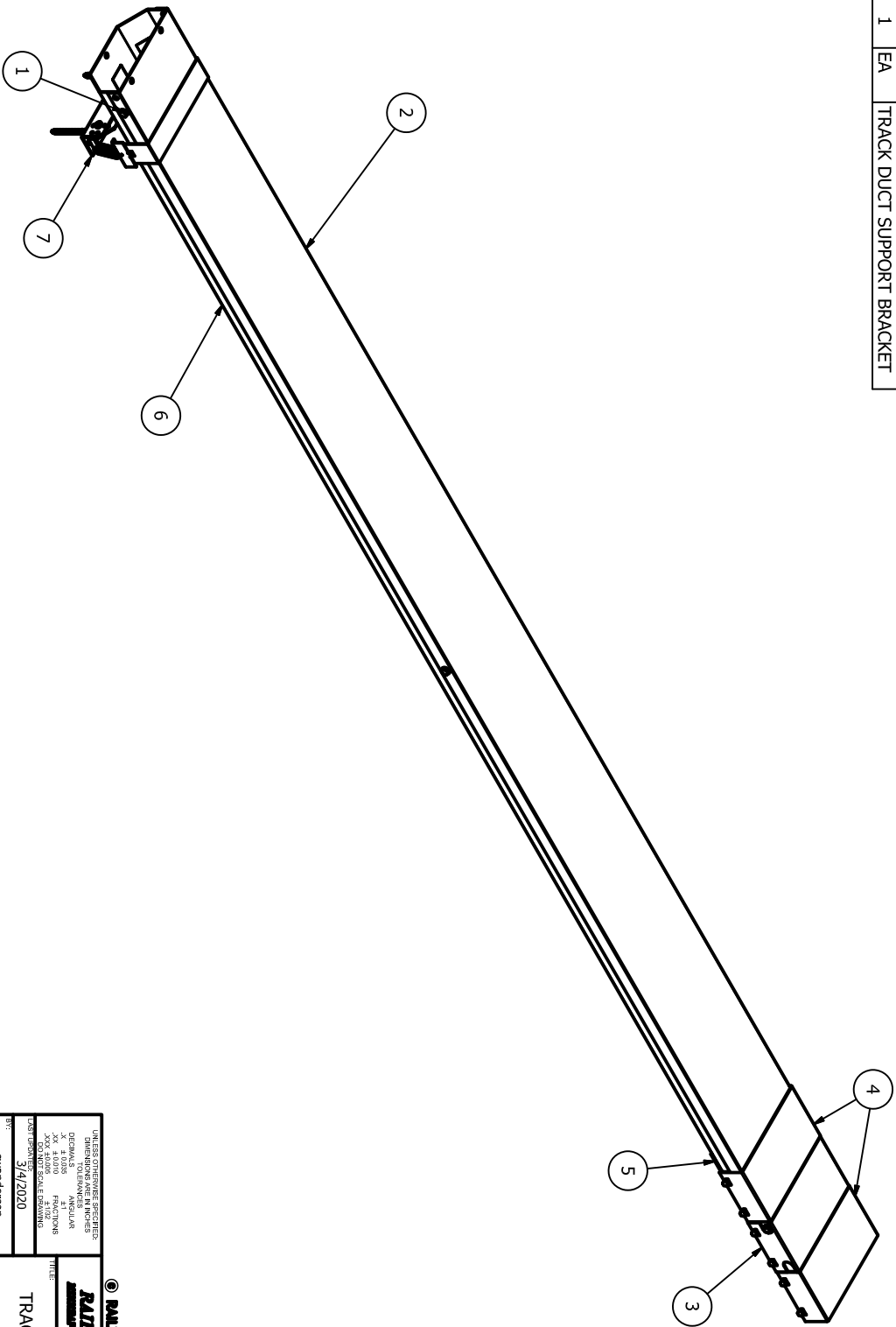
**REVISION:** A

**SCALE:** 1 : 4    **DWG. NO.:** 9528-4222    **SHEET:** 1 OF 1



PARTS LIST					
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	29051	-	6	EA	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
2	92741	E	1	EA	TRACK DUCT COVER, 10'
3	927441	A	1	EA	CENTER COVER, E Z SPLICE
4	927442	A	2	EA	END COVER, E Z SPLICE
5	927450B	B	1	EA	BASE, E Z SPLICE
6	927538	A	1	EA	TRACK DUCT BASE, 10' NO HOLE
7	92774K	K	1	EA	TRACK DUCT SUPPORT BRACKET

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
J	-	REMOVE 92744, 28080, 28081	5/26/1999	TB
K	02-0045	REPLACE 29016 W/ 29051	8/29/2002	RF
L	05-0017	NEW SPLICE SYSTEM	5/18/2005	RF
M	05-0047	NEW SUPPORT ASSEM. DESIGN	10/27/2005	RO
-	-	PN 927450A TO B	3/4/2020	CA



**RAILWAY EQUIPMENT CO. 2020**

**RAILWAY EQUIPMENT CO.**  
 1000 W. 10th Street  
 Grand Rapids, MI 49508  
 (616) 941-2000

**TITLE:** TRACK DUCT SECTION, MID

**DATE:** 3/4/2020

**DESIGNER:** Gwunderson

**CHECKER:** M

**SCALE:** 1/8" = 1'

**SHEET:** 1 OF 1



REV	ECO #	DESCRIPTION	DATE	BY
J	-	UPDATE TRACK DUCT SUPPORT	5/26/1999	TB
K	02-0045	REPLACE 29016 W/ 29051	8/29/2002	RF
L	05-0017	NEW SPLICE SYSTEM	5/18/2005	RF
M	05-0047	NEW SUPPORT ASSEM. DESIGN	10/27/2005	RO
-	-	PN 927450A TO B	3/4/2020	CA

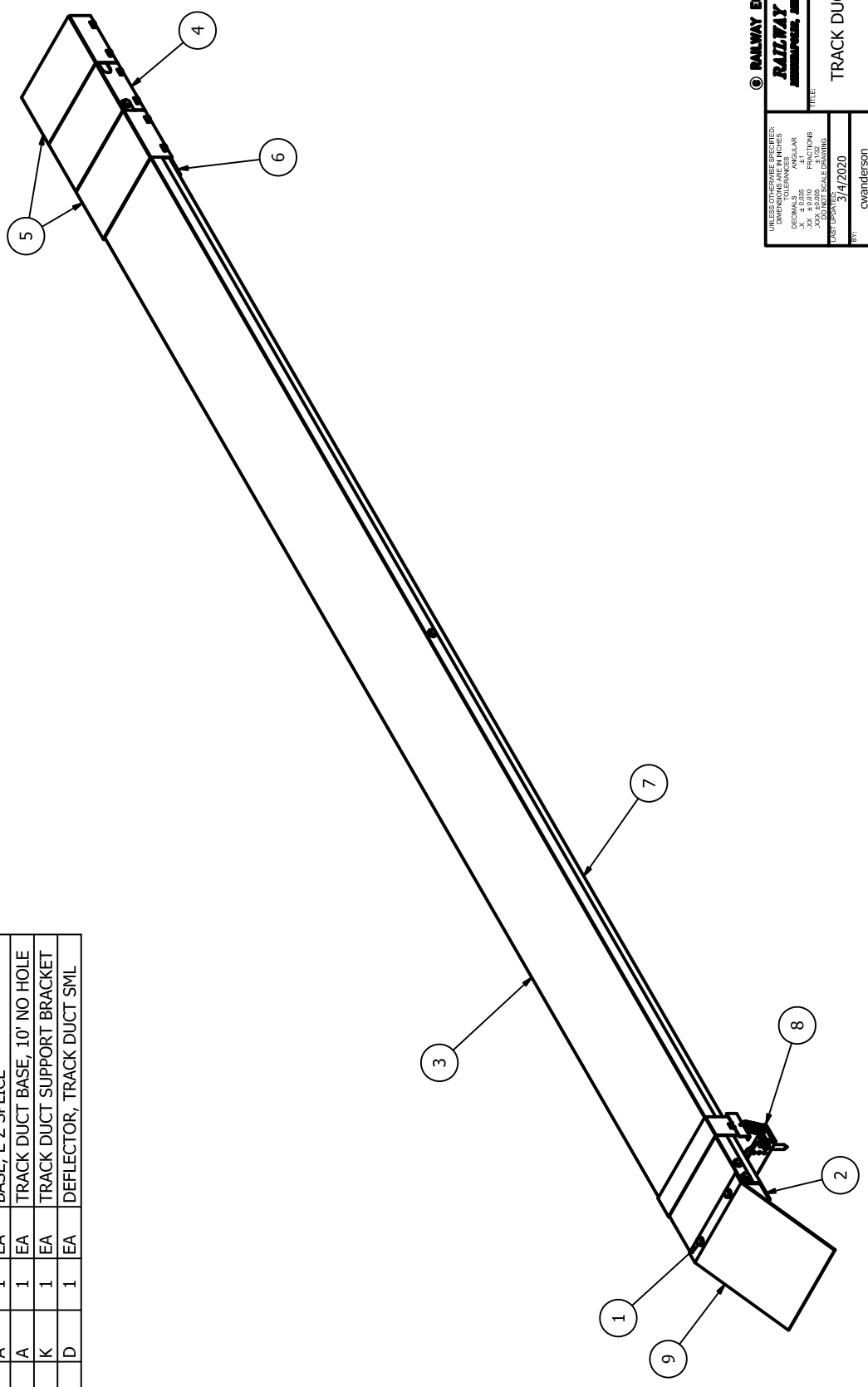
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	29051	-	11	EA	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
2	92740	F	1	EA	END PLATE, TRACK DUCT
3	92741	E	1	EA	TRACK DUCT COVER, 10'
4	927441	A	1	EA	CENTER COVER, E Z SPLICE
5	927442	A	2	EA	END COVER, E Z SPLICE
6	927450	A	1	EA	BASE, E Z SPLICE
7	927538	A	1	EA	TRACK DUCT BASE, 10' NO HOLE
8	92774K	K	1	EA	TRACK DUCT SUPPORT BRACKET
9	92785	D	1	EA	DEFLECTOR, TRACK DUCT SML

PARTS LIST

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	29051	-	11	EA	BOLT, 1/4-20 X 1/2 WITH 1/2 HD
2	92740	F	1	EA	END PLATE, TRACK DUCT
3	92741	E	1	EA	TRACK DUCT COVER, 10'
4	927441	A	1	EA	CENTER COVER, E Z SPLICE
5	927442	A	2	EA	END COVER, E Z SPLICE
6	927450	A	1	EA	BASE, E Z SPLICE
7	927538	A	1	EA	TRACK DUCT BASE, 10' NO HOLE
8	92774K	K	1	EA	TRACK DUCT SUPPORT BRACKET
9	92785	D	1	EA	DEFLECTOR, TRACK DUCT SML

REVISION HISTORY

REV	ECO #	DESCRIPTION	DATE	BY
J	-	UPDATE TRACK DUCT SUPPORT	5/26/1999	TB
K	02-0045	REPLACE 29016 W/ 29051	8/29/2002	RF
L	05-0017	NEW SPLICE SYSTEM	5/18/2005	RF
M	05-0047	NEW SUPPORT ASSEM. DESIGN	10/27/2005	RO
-	-	PN 927450A TO B	3/4/2020	CA



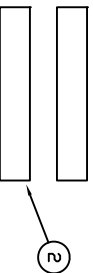
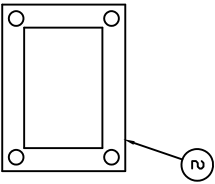
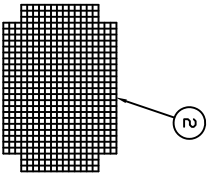
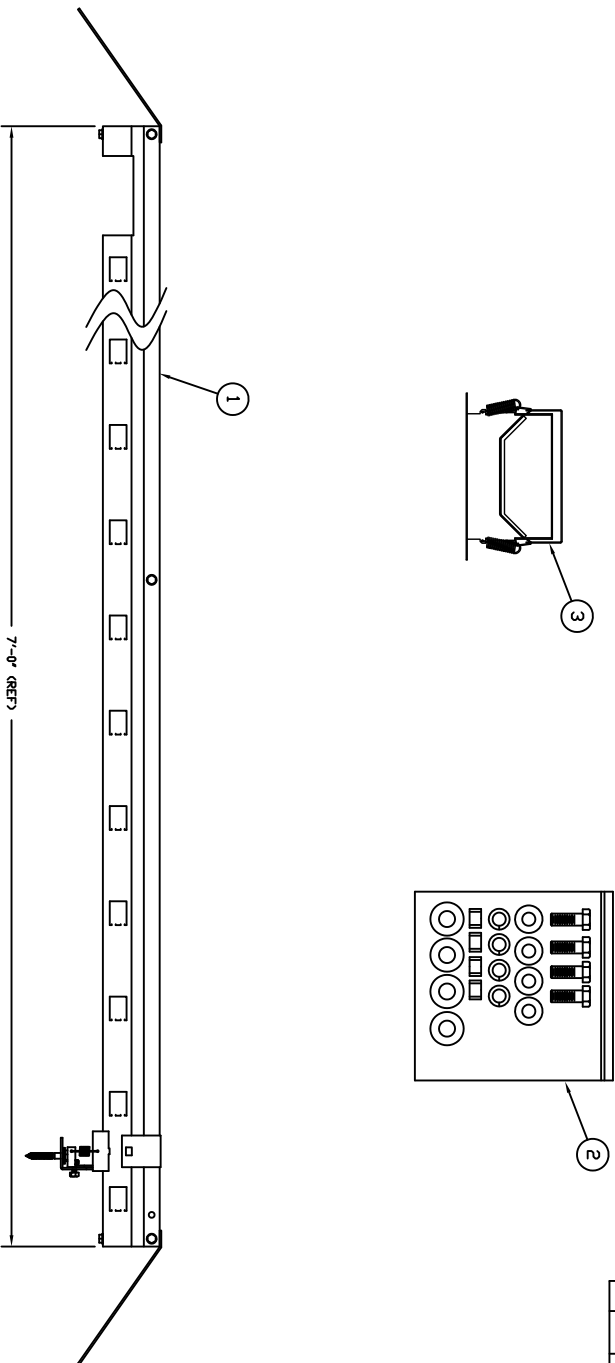
UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS IN INCHES  
DECIMALS TO THIRDS  
ANGULAR TOLERANCES TO NEAREST MINUTE  
FRACTIONS TO NEAREST 1/32  
DIMENSIONS TO CENTER UNLESS OTHERWISE NOTED  
DATE PUBLISHED: 3/4/2020  
BY: cvanderson  
PART: NA  
REVISIONS: NA  
SCALE: 1/8" = 1'-0"  
SHEET: 1 OF 1

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**RAILWAY EQUIPMENT CO.**  
 ANNUETT, MISSOURI  
 (800) 890-0000

TITLE: TRACK DUCT SECTION, HEEL  
 PART NO: 9278-1202M  
 REV: M

ITEM NO.	PART NO.	UOM	QTY	DESCRIPTION
1	9278-0207	EA	1	TRACK DUCT 7' HEEL
2	9278-0277	EA	1	ISO KIT, IR NOZZLE LARGE
3	927490	EA	1	NOZZLE, TRACK DUCT
4	41023	EA	1	BOX, TRACK DUCT KIT

REV.	ECN.	REV.	REVISION DESCRIPTION	DATE	APPROVED
A	02-027	RF	NEW PART	07/03/02	----
B	03-023	RF	UPDATE NOZZLE	07/29/03	----
C	05-017	RF	NEW SPLICE DESIGN	05/25/05	----
D	05-027	RO	NEW TRACK DUCT NOZZLE	11/10/05	----
E	05-054	RJ	NEW TRACK DUCT NOZZLE	02/02/07	----



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DIMENSIONS IN PARENTHESES ARE  
FOR REFERENCE ONLY  
DO NOT SCALE DRAWING

DRAWN: RPF  
DATE: 07/03/02

APPROVED: [Signature]  
DATE: 07/03/02

TITLE: TRACK DUCT KIT, 7' LARGE NOZZLE

DWG NO.: 9278-0270  
SCALE: N/A  
DRAWING SIZE: B  
SHEET: 1 OF 1

REV: E

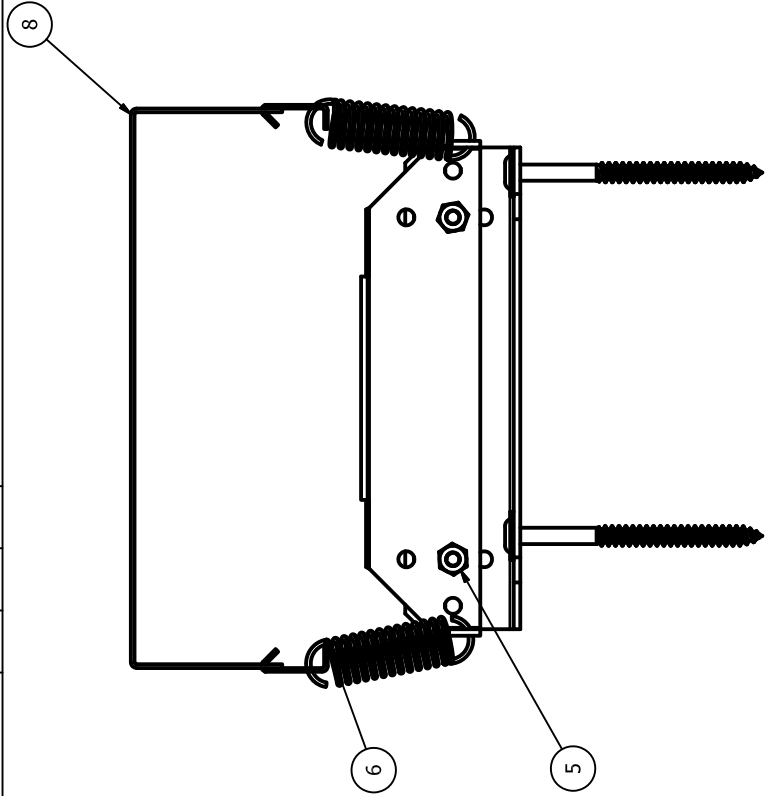
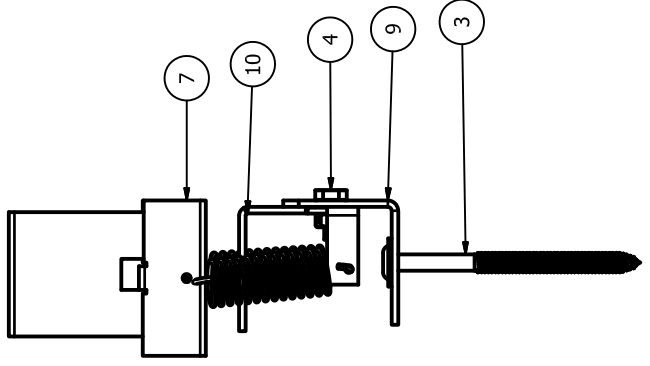
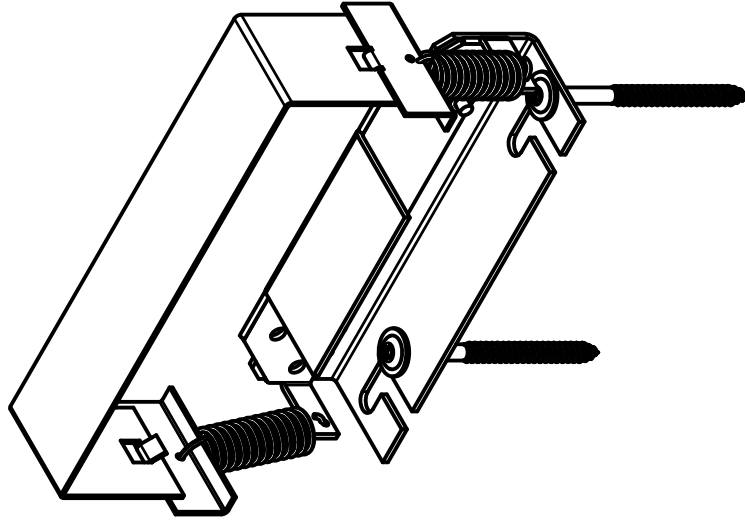
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RAILWAY EQUIPMENT CO.  
DELANO, MINNESOTA (763) 972-2200

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	14042A	A	1	EA	BAG, 4 X 6 X 002 ZIPTOP
2	14045	-	1	EA	BAG, 12 X 15 4MIL ZIPTOP
3	2600976100	-	2	EA	LAG BOLT, 5/16 X 4, WASHER HEAD, 6 LOBE DRIVE, STEEL, GRADE 5, HCR COATING
4	2831551110	-	2	EA	BOLT, 1/4-20 X 5/8 HEX HEAD
5	2832-5901	-	2	EA	NUT, 1/4-20 CENTERLOCK
6	92742B	B	2	EA	SPRING, TRACK DUCT SUPPORT
7	92743	B	2	EA	CLIP, HOLDDOWN SPRING
8	92745	A	1	EA	HOLDDOWN STRAP, T. DUCT
9	927550C	C	1	EA	TRACK DUCT SUPPORT BASE
10	927551	A	1	EA	TRACK DUCT SPRING BRKT NARROW
11	R92774K	-	1	EA	LABEL, TRACK DUCT BRACKET

REVISION HISTORY

REV	ECO #	DESCRIPTION	DATE	BY
J	05-0017	NEW SPLICE SYSTEM	5/18/2005	RF
K	05-0047	SHORTENED 927550-551	10/27/2005	RO



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**RAILWAY EQUIPMENT CO.**  
 ANNE ARBOR, MI 48106 (734) 666-3300

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS IN INCHES  
 DECIMALS TO 3 PLACES  
 FRACTIONS TO 16ths  
 TOLERANCES:  
 XX ±0.010  
 XXX ±0.005  
 XX ±0.010  
 XXX ±0.005  
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 DECIMALS TO 1 PLACE  
 TOLERANCES:  
 XX ±0.10  
 XXX ±0.05

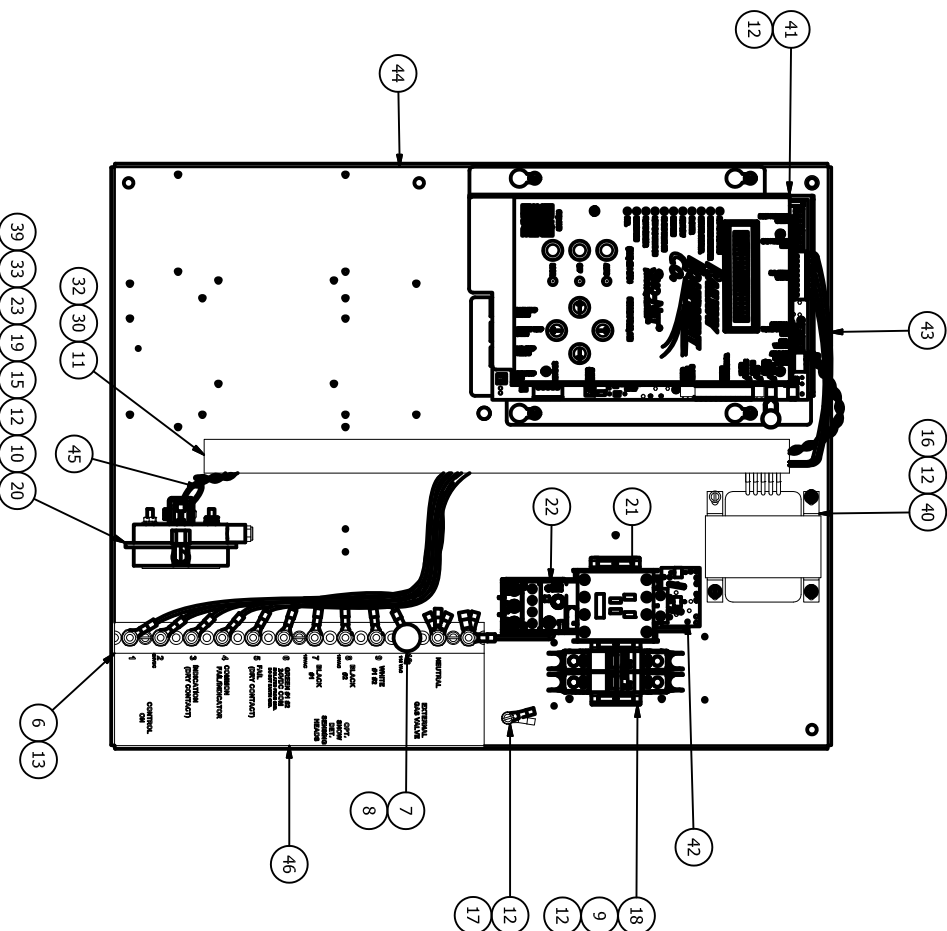
DATE: 2/6/2020  
 BY: cvanderson  
 PART: NA  
 DRAWING: 92774K  
 SCALE: 1/2  
 SHEET: 1 OF 1

TITLE: TRACK DUCT SUPPORT BRACKET

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	1300749600		1	EA	CIRCUIT BREAKER, 2 POLES 30 AMP 480 VOLT INDUCTIVE
2	21020		1	EA	CONNECTOR, HOUSING, 2 POS
3	21021		1	EA	STRAIN RELIEF, 2 POS
4	21023		1	EA	STRAIN RELIEF, 3 POS
5	21212		1	EA	CONNECTOR, HOUSING, 3 POS 18GA
6	28029		1	EA	TERMINAL ASSY, 1 X 12 POS
7	28090		1	EA	CAP, TERMINAL POST INSULATING
8	28091		1	EA	SHIELD, TERMINAL POST INSULATE
9	28104		5	IN	DIN MOUNTING RAIL 35MM
10	2831211116		2	EA	SCREW, #6-32 X 1 PAN SLT
11	2831311106		5	EA	SCREW, #8-32 X 3/8 PAN SLT
12	2831411106		13	EA	SCREW, #10-32 X 3/8 PAN SLT
13	2831411110		3	EA	SCREW, #10-32 X 5/8 PAN SLT
14	2832-4301		2	EA	NUT, #10-32 KEPS
15	2832-6301		2	EA	NUT, #6-32 KEPS
16	2833-4210		4	EA	WASHER, #10 SPLT LOCK
17	2833-4310		2	EA	WASHER, #10 EXT. STAR
18	29104		3	EA	CLAMP, DIN MOUNT END
19	35205A		1	EA	BRACKET, PRESSURE SWITCH MOUNT FOR PANEL
20	53096		1	EA	PRESSURE SWITCH
21	5400490000		1	EA	CONTRACTOR, 40A, 4P, 115V AC COIL, AB, SIZE C40
22	5400492000		1	EA	OVERLOAD, 9.0 - 45A, EI PLUS, 1 PHASE
23	60167		1	EA	FITTING, 906 MALE BRASS
24	6032-0111		3	EA	LUG, RING #10 16-14GA NYLON
25	6032-0117		1	EA	LUG, RING 1/4 12-10GA VINYL
26	6032-0118		3	EA	LUG, RING 1/4 16-14GA VINYL
27	6032-0120		1	EA	LUG, RING 1/4 22-18GA VINYL
28	6034-0111		1	EA	LUG, PUSH-ON F. 250 22-18GA
29	6034-0115		1	EA	LUG, PUSH-ON F. 250 12-10GA
30	6093-0003		19	IN	WIRE DUCT, 1IN W 3IN H
31	6093-0100		15	EA	CABLE TIE, 4IN 0.10 WIDTH
32	6093-0302		19	IN	WIRE DUCT, COVER 1 IN
33	61090		1	EA	MUFFLER / FILTER, 1/8" NPT, 7/16" DIA.
35	681001		42	IN	WIRE, 10GA BLACK
36	681601		28	IN	WIRE, 16GA GREEN - HOOK UP
37	681832		62	IN	WIRE, 18GA 300V 10SC BLACK
38	681833		45	IN	WIRE, 18GA THINWALL WHITE 300V
39	681834		18	IN	WIRE, 18GA THINWALL RED 300V
39	7600001200		1	EA	ENCLOS FOR SCREW TERM LRG SWITCH
40	9338-0015C		1	EA	TRANSFORMER, CONTROL MODULE
41	9338-0320P		1	EA	CONTROL MODULE, GHAB W / TC / WEB PAGE ENABLE
42	9338-0325B		1	EA	SURGE ARRESTOR ASSY, 240V 1PH
43	9508-0001A		1	EA	GHAB MODULE TO AAR HARNESS
44	95085D		1	EA	PANEL, GHAB CON WITH DISPLAY
44	9538-0029B		1	EA	ASSY, AIR FLOW WIRES HIGH IN PANEL
46	R9330-0021B		1	EA	LABEL, TERM POST SNO NET

PARTS LIST

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	18-0029	NEW PART	8/16/2018	TB
B	18-0034	O MODULE	12/18/2018	JT
C	-	ALLEN BRADLEY ELECTRONICS	12/2/2019	AK



UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS

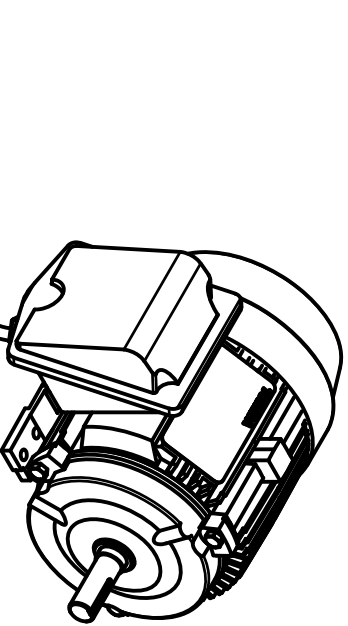
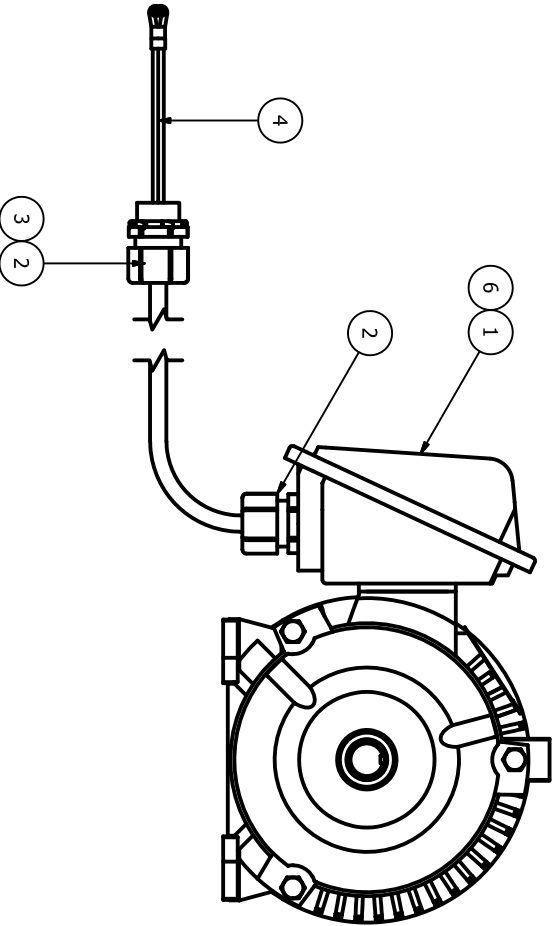
DECIMALS: ANGULAR  
XX, X, 0.01"  
FRACTIONS: 1/16, 1/8, 3/16, 1/2, 5/8, 3/4, 7/8, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 2 3/4, 3, 3 1/4, 3 1/2, 3 3/4, 4, 4 1/4, 4 1/2, 4 3/4, 5, 5 1/4, 5 1/2, 5 3/4, 6, 6 1/4, 6 1/2, 6 3/4, 7, 7 1/4, 7 1/2, 7 3/4, 8, 8 1/4, 8 1/2, 8 3/4, 9, 9 1/4, 9 1/2, 9 3/4, 10, 10 1/4, 10 1/2, 10 3/4, 11, 11 1/4, 11 1/2, 11 3/4, 12, 12 1/4, 12 1/2, 12 3/4, 13, 13 1/4, 13 1/2, 13 3/4, 14, 14 1/4, 14 1/2, 14 3/4, 15, 15 1/4, 15 1/2, 15 3/4, 16, 16 1/4, 16 1/2, 16 3/4, 17, 17 1/4, 17 1/2, 17 3/4, 18, 18 1/4, 18 1/2, 18 3/4, 19, 19 1/4, 19 1/2, 19 3/4, 20, 20 1/4, 20 1/2, 20 3/4, 21, 21 1/4, 21 1/2, 21 3/4, 22, 22 1/4, 22 1/2, 22 3/4, 23, 23 1/4, 23 1/2, 23 3/4, 24, 24 1/4, 24 1/2, 24 3/4, 25, 25 1/4, 25 1/2, 25 3/4, 26, 26 1/4, 26 1/2, 26 3/4, 27, 27 1/4, 27 1/2, 27 3/4, 28, 28 1/4, 28 1/2, 28 3/4, 29, 29 1/4, 29 1/2, 29 3/4, 30, 30 1/4, 30 1/2, 30 3/4, 31, 31 1/4, 31 1/2, 31 3/4, 32, 32 1/4, 32 1/2, 32 3/4, 33, 33 1/4, 33 1/2, 33 3/4, 34, 34 1/4, 34 1/2, 34 3/4, 35, 35 1/4, 35 1/2, 35 3/4, 36, 36 1/4, 36 1/2, 36 3/4, 37, 37 1/4, 37 1/2, 37 3/4, 38, 38 1/4, 38 1/2, 38 3/4, 39, 39 1/4, 39 1/2, 39 3/4, 40, 40 1/4, 40 1/2, 40 3/4, 41, 41 1/4, 41 1/2, 41 3/4, 42, 42 1/4, 42 1/2, 42 3/4, 43, 43 1/4, 43 1/2, 43 3/4, 44, 44 1/4, 44 1/2, 44 3/4, 45, 45 1/4, 45 1/2, 45 3/4, 46, 46 1/4, 46 1/2, 46 3/4

DATE: 3/16/2020  
DRAWN BY: akollman  
CHECKED BY: N/A  
APPROVED BY: N/A

© RAILWAY EQUIPMENT CO. 2018  
RAILWAY EQUIPMENT CO.  
ASSY, GHAB CONTROL PANEL 2HP  
230V 1PH  
9508-0155C  
SCALE: 1/4" = 1" DIM. SIZE: B SHEET 1 OF 2



PARTS LIST					
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	35032	-	EA	1	MOTOR, 2HP 230/460V 3 PHASE 3600 RPM TEFC 145T
2	60.001	-	EA	2	CONNECTOR, CORD 3/4IN STRAIGHT
3	60.003	-	EA	1	CONDUIT, LOCK NUT 3/4 IN
4	60018	-	FT	7.25	CORD, STRAIGHT 14/4 SOOW
5	6032-0111	-	EA	5	LUG, RING #10 16-14GA NYLON
6	6092-0200	-	EA	4	LUG, WIRE JOINT NYLON



REVISION HISTORY			
REV	ECO #	DESCRIPTION	DATE
A	-	NEW ASSEMBLY	3/7/2019

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**RAILWAY EQUIPMENT CO.**  
*RAILWAY EQUIPMENT* (PH) 800-450-4500

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 XX .010" FRACTIONS  
 X.XX .005" SCALE DRAWINGS

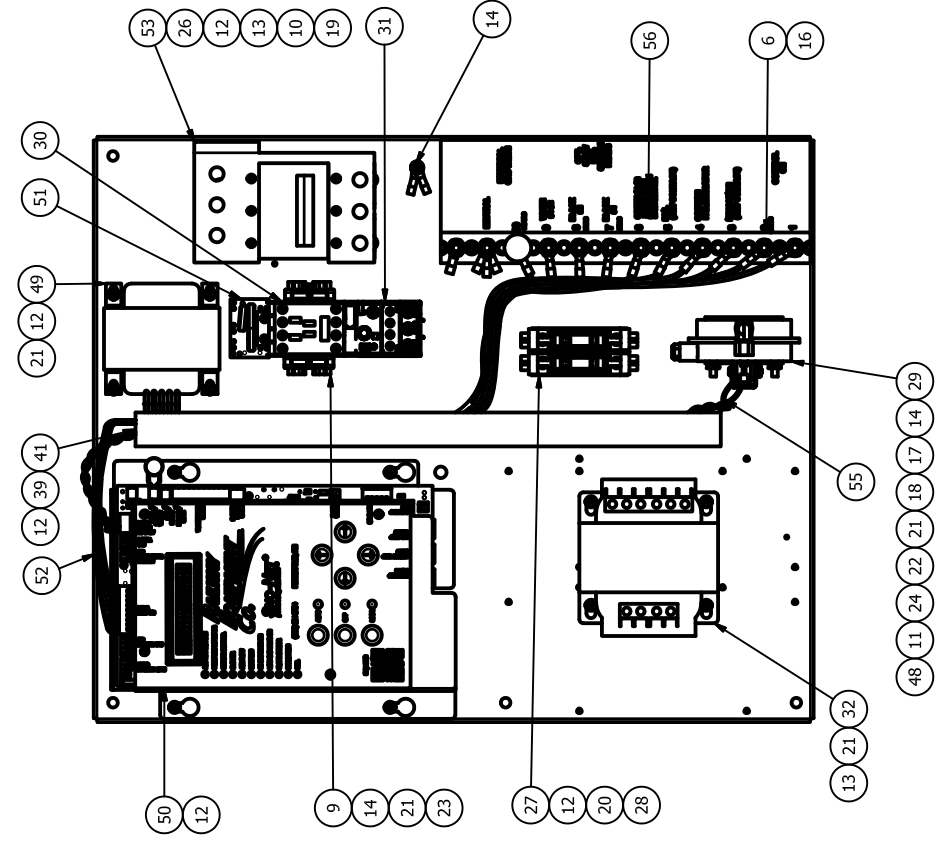
DATE: 1/15/2020  
 BY: akollman  
 TITLE: ASSY, WIRED MOTOR, 2HP/230/3PH  
 DWG NO: 9538-0065A  
 REV: A

SCALE: 1/32  
 TENS SIZE: B  
 SHEET 1 OF 1

PARTS LIST		REVISION HISTORY	
ITEM	REV QTY	DESCRIPTION	DATE
1	1	BAG, 9 X 12 4MIL ZIPTOP	7/15/2019
2	1	CONNECTOR, HOUSING, 2 POS	7/15/2019
3	1	STRAIN RELIEF, 2 POS	11/12/2019
4	1	STRAIN RELIEF, 3 POS	11/12/2019
5	1	CONNECTOR, HOUSING, 3 POS 18GA	
6	1	TERMINAL ASSY, 1 X 12 POS	
7	1	CAP, TERMINAL POST INSULATING	
8	1	SHIELD, TERMINAL POST INSULATE	
9	3	DIN MOUNTING RAIL 35MM	
10	6	SCREW, #6-32 X 3/8 PAN SLT	
11	2	SCREW, #6-32 X 1 PAN SLT	
12	9	SCREW, #8-32 X 3/8 PAN SLT	
13	2	SCREW, #8-32 X 1/2 PAN SLT	
14	13	SCREW, #10-32 X 3/8 PAN SLT	
15	4	SCREW, #10-32 X 1/2 PAN SLT	
16	3	SCREW, #10-32 X 5/8 PAN SLT	
17	2	NUT, #10-32 KEPS	
18	2	NUT, #6-32 KEPS	
19	4	WASHER, #8 FLAT SAE	
20	2	WASHER, #8 SPLIT LOCK	
21	8	WASHER, #10 SPLIT LOCK	
22	2	WASHER, #10 EXT. STAR	
23	2	CLAMP, DIN MOUNT END	
24	1	BRACKET, PRESSURE SWITCH MOUNT FOR PANEL	
25	2	FUSE, 500V 1AMP SLO-BLO	
26	1	CIR BRKR, 15A 600V 3 POLE	
27	1	FUSEBLOCK, 600V 30A 2 POLE	
28	2	FUSEBLOCK COVER 600V 30A	
29	1	PRESSURE SWITCH	
30	1	CONTRACTOR, 4POLE 32 AMP 115V COIL 9 AMP INDUCTIVE	
31	1	OVERLOAD RELAY, 1.0 - 5.0	
32	1	TRANS, 575 MAX P-115S 300VA	
33	1	FITTING, 900 MALE BRASS	
34	1	LUG, FORK #6 16-14GA NYLON	
35	3	LUG, FORK #6 22-18GA NYLON	
36	3	LUG, RING #10 16-14GA NYLON	
37	5	LUG, RING 1/4 16-14GA VINYL	
38	1	LUG, RING 1/4 22-18GA VINYL	
39	19	WIRE DUCT, 1IN W 3IN H	
40	15	WIRE DUCT, COVER 1 IN	
41	19	WIRE DUCT, COVER 1 IN	
42	1	MUFFLER / FILTER, 1/8" NPT, 7/16" DIA.	
43	42	WIRE, 10GA BLACK 600V 105C	
44	57	WIRE, 16GA GREEN - HOOK UP	
45	125	WIRE, 18GA 600V THINWALL BLACK	
46	681833	WIRE, 18GA THINWALL WHITE 300V	
47	681834	WIRE, 18GA THINWALL RED 300V	
48	1	ENCLOS FOR SCREW TERM LRG SWITCH	

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
49	9338-0015C	C	1	EA	TRANSFORMER, CONTROL MODULE
50	9338-0320P	P	1	EA	CONTROL MODULE, GHAB W / TC / WEB PAGE ENABLE
51	9338-0326B	B	1	EA	SURGE ARRESTOR ASSY, 600V 3PH
52	9508-0001A	A	1	EA	GHAB MODULE TO AAR HARNESS
53	950801.10B	B	1	EA	FINGER SAFE COVER FOR 51200
54	95085D	D	1	EA	PANEL, GHAB CON WITH DISPLAY
55	9538-0029B	B	1	EA	ASSY, AIR FLOW WIRES HIGH IN PANEL
56	R9330-0021B	B	1	EA	LABEL, TERM POST SINO NET

ITEM	REV	QTY	UOM	DESCRIPTION
1	-	1	EA	BAG, 9 X 12 4MIL ZIPTOP
2	-	1	EA	CONNECTOR, HOUSING, 2 POS
3	-	1	EA	STRAIN RELIEF, 2 POS
4	-	1	EA	STRAIN RELIEF, 3 POS
5	-	1	EA	CONNECTOR, HOUSING, 3 POS 18GA
6	-	1	EA	TERMINAL ASSY, 1 X 12 POS
7	-	1	EA	CAP, TERMINAL POST INSULATING
8	-	1	EA	SHIELD, TERMINAL POST INSULATE
9	-	3	IN	DIN MOUNTING RAIL 35MM
10	-	6	EA	SCREW, #6-32 X 3/8 PAN SLT
11	-	2	EA	SCREW, #6-32 X 1 PAN SLT
12	-	9	EA	SCREW, #8-32 X 3/8 PAN SLT
13	-	2	EA	SCREW, #8-32 X 1/2 PAN SLT
14	-	13	EA	SCREW, #10-32 X 3/8 PAN SLT
15	-	4	EA	SCREW, #10-32 X 1/2 PAN SLT
16	-	3	EA	SCREW, #10-32 X 5/8 PAN SLT
17	-	2	EA	NUT, #10-32 KEPS
18	-	2	EA	NUT, #6-32 KEPS
19	-	4	EA	WASHER, #8 FLAT SAE
20	-	2	EA	WASHER, #8 SPLIT LOCK
21	-	8	EA	WASHER, #10 SPLIT LOCK
22	-	2	EA	WASHER, #10 EXT. STAR
23	-	2	EA	CLAMP, DIN MOUNT END
24	A	1	EA	BRACKET, PRESSURE SWITCH MOUNT FOR PANEL
25	-	2	EA	FUSE, 500V 1AMP SLO-BLO
26	-	1	EA	CIR BRKR, 15A 600V 3 POLE
27	-	1	EA	FUSEBLOCK, 600V 30A 2 POLE
28	-	2	EA	FUSEBLOCK COVER 600V 30A
29	-	1	EA	PRESSURE SWITCH
30	-	1	EA	CONTRACTOR, 4POLE 32 AMP 115V COIL 9 AMP INDUCTIVE
31	-	1	EA	OVERLOAD RELAY, 1.0 - 5.0
32	-	1	EA	TRANS, 575 MAX P-115S 300VA
33	-	1	EA	FITTING, 900 MALE BRASS
34	-	1	EA	LUG, FORK #6 16-14GA NYLON
35	-	3	EA	LUG, FORK #6 22-18GA NYLON
36	-	3	EA	LUG, RING #10 16-14GA NYLON
37	-	5	EA	LUG, RING 1/4 16-14GA VINYL
38	-	1	EA	LUG, RING 1/4 22-18GA VINYL
39	-	19	IN	WIRE DUCT, 1IN W 3IN H
40	-	15	EA	WIRE DUCT, COVER 1 IN
41	-	19	IN	WIRE DUCT, COVER 1 IN
42	-	1	EA	MUFFLER / FILTER, 1/8" NPT, 7/16" DIA.
43	-	42	IN	WIRE, 10GA BLACK 600V 105C
44	-	57	IN	WIRE, 16GA GREEN - HOOK UP
45	-	125	IN	WIRE, 18GA 600V THINWALL BLACK
46	-	681833	IN	WIRE, 18GA THINWALL WHITE 300V
47	-	681834	IN	WIRE, 18GA THINWALL RED 300V
48	-	1	EA	ENCLOS FOR SCREW TERM LRG SWITCH



**NOTE:**  
 1. PLACE (1) FINGER SAFE COVER (PN 9508110B)  
 AND (6) SCREWS (PN 2831211106) INTO  
 (1) ZIPLOCK BAG (PNI4046) AND ATTACH TO PANEL.

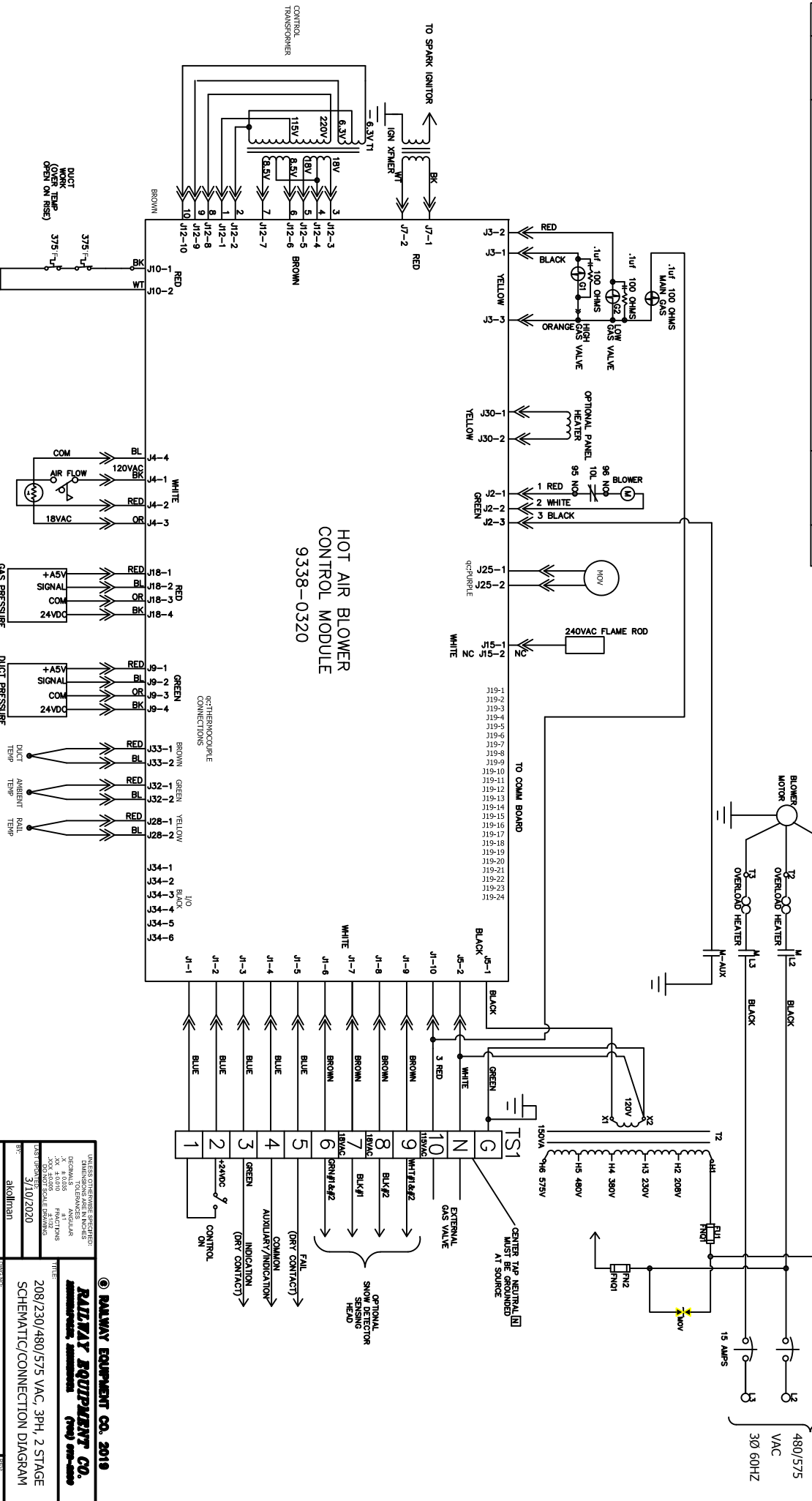
**RAILWAY EQUIPMENT CO. 2019**  
**RAILWAY EQUIPMENT CO.**  
 1000 W. 10TH ST. S. #100  
 TULSA, OK 74103  
 (918) 439-1000

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS TO TWO PLACES  
 FRACTIONS TO 16THS  
 .XX & 0.00 TO 1/16" SCALE DRAWING  
 .XXX & 0.000 TO 1/32" SCALE DRAWING

DATE: 3/10/2020  
 BY: akollman  
 TITLE: ASSY, GHAB CONTROL 2HP 575V 3PH

SCALE: 1:1  
 SHEET: 1 OF 2

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	11-0014	NEW PART	7/15/2019	GJ
B	-	REV N MODULE	9/19/18	TB
C	-	REMOVED OPTIONAL HEATER AND TEMP SWITCH	5/21/19	CA
D	-	NEW MODULE	1/23/20	AK



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 .XX 3.000 FRACTIONS  
 .XX .000 ANGULAR FRACTIONS  
 .XX .000 ANGULAR FRACTIONS  
 .XX .000 ANGULAR FRACTIONS

DATE: 3/10/2020  
 DRAWN BY: akolman  
 CHECKED BY: NA

SCALE: DIMENSION B  
 SHEET 2 OF 2

© RAILWAY EQUIPMENT CO. 2019  
**RAILWAY EQUIPMENT CO.**  
 208/230/480/575 VAC, 3PH, 2 STAGE  
 SCHEMATIC/CONNECTION DIAGRAM  
 9508-0158B

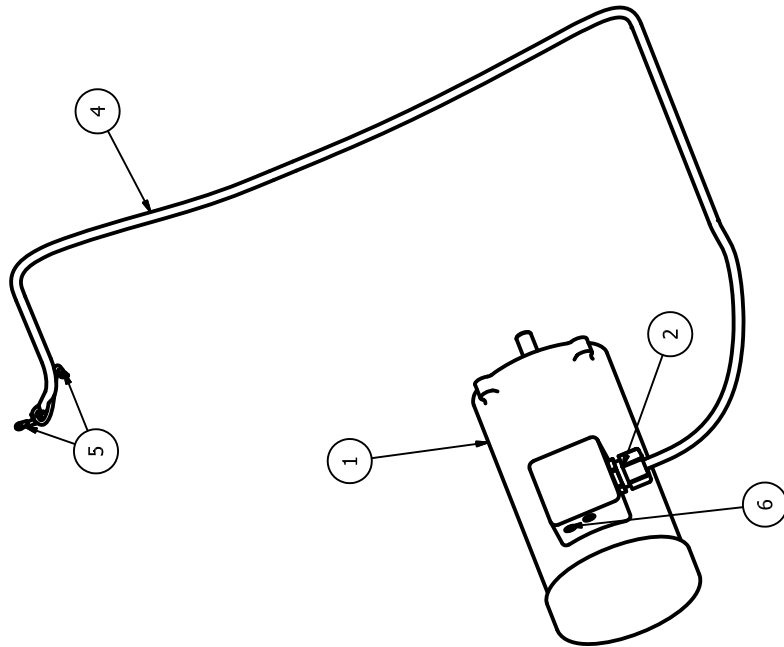


PARTS LIST

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	35033	-	1	EA	MOTOR, 2HP TEFC 3PH 145T
2	60.001	-	1	EA	CONNECTOR, CORD 3/4IN STRAIGHT
3	60.003	-	1	EA	CONDUIT, LOCK NUT 3/4 IN
4	60018	-	7	FT	CORD, STRAIGHT 14/4 SOOW
5	6032-0111	-	2	EA	LUG, RING #10 16-14GA NYLON
6	6092-0200	-	3	EA	LUG, WIRE JOINT NYLON

REVISION HISTORY

REV	ECO #	DESCRIPTION	DATE	BY
A	-	NEW PART	7/12/2019	VMAS



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**RAILWAY EQUIPMENT CO.**  
RAILWAY EQUIPMENT COMPANY

TITLE: ASSY, WIRED MOTOR 2HP 575V  
3PH

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS IN PARENT BRACKETS  
DECIMALS IN PARENT BRACKETS  
.XX ±.010 FRACTIONS  
.XX ±.010 FRACTIONS  
TOLERANCE SCALE DRAWING

DATE: 8/1/2019  
BY: vschulte

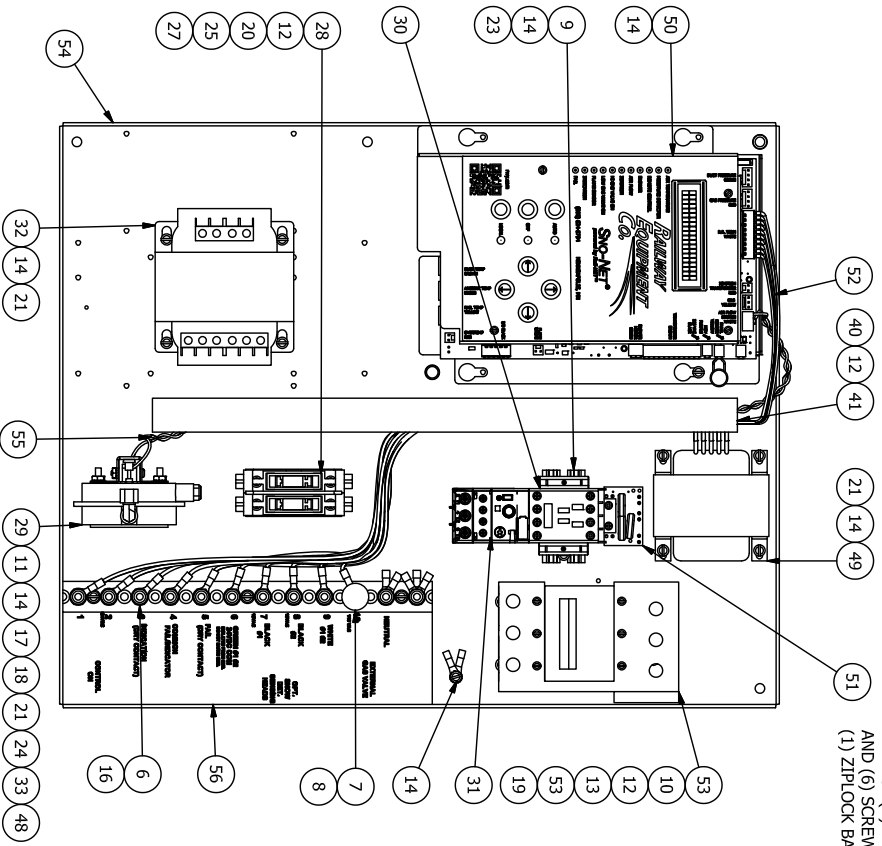
MATERIAL: N/A  
FINISH: N/A

SCALE: 0.2:1 DIM. SIZE: B  
SHEET 1 OF 1

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	14046	-	EA	1	BAG, 9 X 12 4MIL ZIPTOP
2	21020	-	EA	1	CONNECTOR, HOUSING, 2 POS
3	21021	-	EA	1	STRAIN RELIEF, 2 POS
4	21023	-	EA	1	STRAIN RELIEF, 3 POS
5	21212	-	EA	1	CONNECTOR, HOUSING, 3 POS 18GA
6	28029	-	EA	1	TERMINAL ASSY, 1 X 12 POS
7	28090	-	EA	1	CAP, TERMINAL POST INSULATING
8	28091	-	EA	1	SHIELD, TERMINAL POST INSULATE
9	28104	-	IN	3	DIN MOUNTING RAIL 39MM
10	2831211106	-	EA	6	SCREW, #6-32 X 3/8 PAN SLT
11	2831211116	-	EA	2	SCREW, #6-32 X 1 PAN SLT
12	2831311106	-	EA	9	SCREW, #8-32 X 3/8 PAN SLT
13	2831311108	-	EA	2	SCREW, #8-32 X 1/2 PAN SLT
14	2831411106	-	EA	13	SCREW, #10-32 X 3/8 PAN SLT
15	2831411108	-	EA	4	SCREW, #10-32 X 1/2 PAN SLT
16	2831411110	-	EA	3	SCREW, #10-32 X 5/8 PAN SLT
17	2832-4301	-	EA	2	NUT, #10-32 KEPS
18	2832-6301	-	EA	2	NUT, #6-32 KEPS
19	2833-3110	-	EA	4	WASHER, #8 FLAT SAE
20	2833-3200	-	EA	2	WASHER, #8 SPLIT LOCK
21	2833-4210	-	EA	8	WASHER, #10 SPLIT LOCK
22	2833-4310	-	EA	2	WASHER, #10 EXT. STAR
23	29104	-	EA	2	CLAMP, DIN MOUNT END
24	35205A	A	EA	2	BRACKET, PRESSURE SWITCH MOUNT FOR PANEL
25	5111-0801	-	EA	1	FUSE, 500V 1AMP SLO-BLO
26	51200	-	EA	1	CHR BRKR, 15A 600V 3 POLE
27	5122-0400	-	EA	1	FUSEBLOCK, 600V 30A 2 POLE
28	5122-0401	-	EA	2	FUSEBLOCK COVER 600V 30A
29	53096	-	EA	1	PRESSURE SWITCH
30	5400489800	-	EA	1	CONTACTOR, 4POLE 32 AMP 115V COIL 9 AMP INDUCTIVE
31	5400490300	-	EA	1	OVERLOAD RELAY, 3.2 - 16.0
32	56058	-	EA	1	TRANS, 575 MAX P-175S 300VA
33	60167	-	EA	1	FITTING, 900 MALE BRASS
34	6031-0101	-	EA	1	LUG, FORK #8 16-14GA NYLON
35	6031-0102	-	EA	3	LUG, FORK #8 22-18GA NYLON
36	6032-0111	-	EA	3	LUG, RING #10 16-14GA NYLON
37	6032-0118	-	EA	5	LUG, RING 1/4 16-14GA VINYL
38	6032-0120	-	EA	1	LUG, RING 1/4 22-18GA VINYL
39	6093-0003	-	IN	19	WIRE DUCT, 1IN W 3IN H
40	6093-0100	-	EA	15	CABLE TIE, 4IN 0.10 WIDTH
41	6093-0302	-	IN	19	WIRE DUCT, COVER 1 IN
42	61090	-	EA	1	MUFFLER / FILTER, 1/8" NPT, 7/16" DIA.
43	681001	-	IN	42	WIRE, 10GA BLACK 600V 105C
44	681601	-	IN	57	WIRE, 16GA GREEN - HOOK UP
45	681831	-	IN	125	WIRE, 18GA 600V THINWALL BLACK
46	681833	-	IN	49	WIRE, 18 GA THINWALL WHITE 300V
47	681834	-	IN	19	WIRE, 18GA THINWALL RED 300V
48	7600001200	-	EA	1	ENCLOSURE FOR SCREW TERM LRG SWITCH
49	9338-0015C	-	EA	1	TRANSFORMER, CONTROL MODULE
50	9338-0320P	-	EA	1	CONTROL MODULE, GHAB W / TC / WEB PAGE ENABLE
51	9338-0328B	-	EA	1	SURGE ARRESTOR ASSY, 600V 3PH
52	9508-0001A	-	EA	1	GHAB MODULE TO AAR HARNESS
53	95080110B	-	EA	1	FINGER SAFE COVER FOR 51200
54	95085D	-	EA	1	PANEL, GHAB CON WITH DISPLAY
55	9538-0029B	-	EA	1	ASSY, AIR FLOW WIRES HIGH IN PANEL
56	R9330-0021B	-	EA	1	LABEL, TERM POST SNO NET

Parts List

REVISION HISTORY			
REV	ECO #	DESCRIPTION	DATE
A	-	NEW PART	8/19/2019
B	-	REPLACED PANEL, CONTACTOR AND OIL	11/12/2019



**NOTE:**  
 1. PLACE (1) FINGER SAFE COVER (PN 9508110B)  
 AND (6) SCREWS (PN 2831211106) INTO  
 (1) ZIPLOCK BAG (PN14046) AND ATTACH TO PANEL.

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**RAILWAY EQUIPMENT CO.**  
 BELLVALE, MINNESOTA (763) 975-6900

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 XX, 4, 0.010 FRACTIONS  
 30.0007 SCALE DRAWING  
 DRAWN: AK  
 DATE: 3/10/2020  
 INT'L: SEE B.O.M.  
 TOLERANCES:  
 FRACTIONS: N/A

TITLE: ASSY, GHAB CONTROL PANEL 2HP 460V 3PH

DWG NO: 9508-0157B  
 SCALE: 1" = 2"  
 PWS: B  
 SHEET 1 OF 2  
 REV: B

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

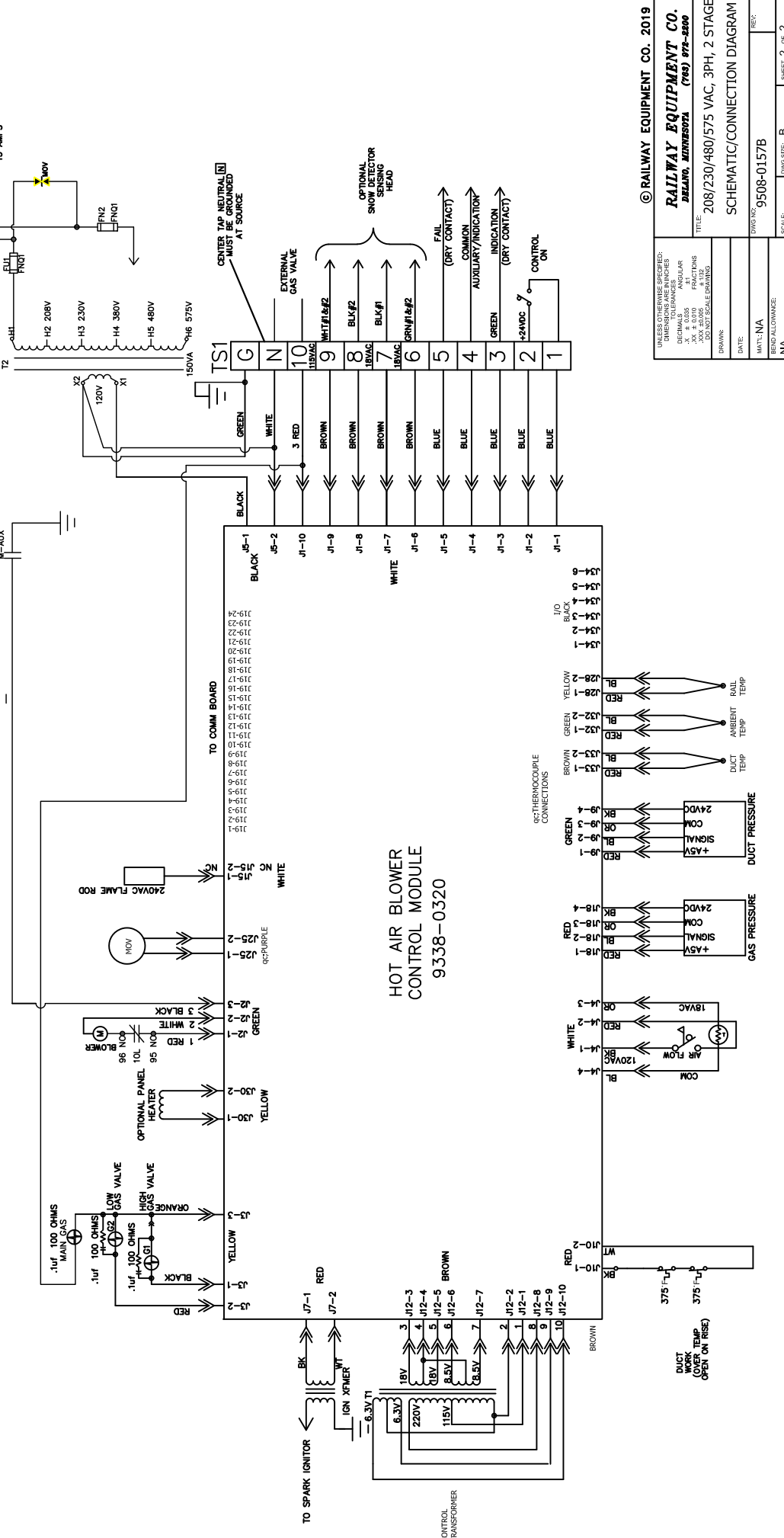
15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS

208/230  
480/575  
VAC  
3Ø 60HZ

15 AMPS



HOT AIR BLOWER  
CONTROL MODULE  
9338-0320

© RAILWAY EQUIPMENT CO. 2019

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DIMENSIONS IN PARENTHESES ARE ANGULAR  
FRACTIONS  
XX ± 0.010  
XXX ± 0.005  
XXX ± 0.0025  
XXX ± 0.0015  
XXX ± 0.001

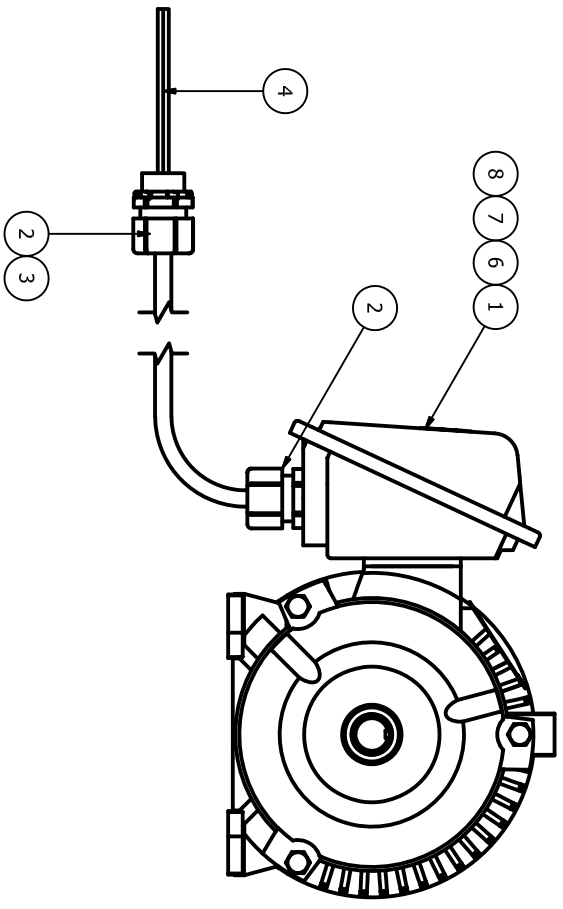
TITLE: 208/230/480/575 VAC, 3PH, 2 STAGE  
SCHEMATIC/CONNECTION DIAGRAM

DRAWN: NA  
DATE: NA  
REV: NA  
SCALE: 1/8" = 1"

DWG NO: 9508-0157B  
SHEET 2 OF 2

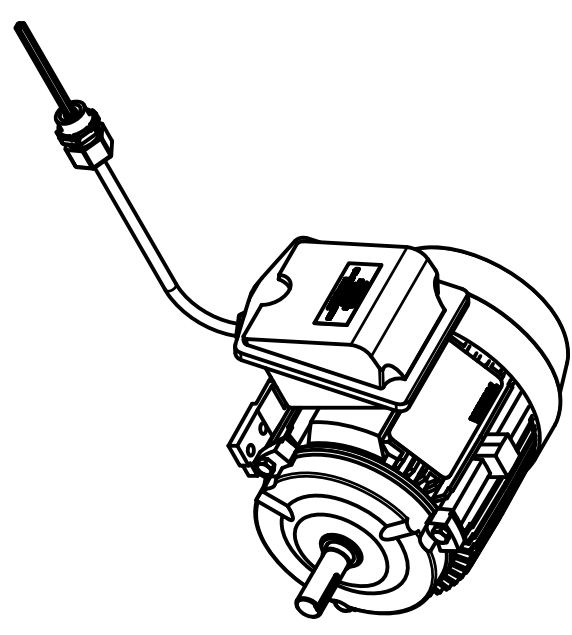
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	35032	-	1	EA	MOTOR, 2HP 230/460V 3 PHASE 3600 RPM TEFC 145T
2	60.001	-	2	EA	CONNECTOR, CORD 3/4IN STRAIGHT
3	60.003	-	1	EA	CONDUIT, LOCK NUT 3/4 IN
4	60018	-	7.25	FT	CORD, STRAIGHT 14/4 SOOW
5	6032-0111	-	1	EA	LUG, RING #10 16-14GA NYLON
6	6092-0200	-	3	EA	LUG, WIRE JOINT NYLON
7	6092-0201	-	3	EA	LUG, WIRE JOINT NYLON
8	R9538-0066A	A	1	EA	LABEL, WIRED MOTOR, 2HP/460/3PH HIGH USE WITH AC DRIVE

PARTS LIST



REV	ECO #	DESCRIPTION	DATE	BY
A	-	NEW ASSEMBLY	8/14/2019	CA
-	-	ADDED PN 6092-0201, PN R9538-0066A	2/17/2020	CA

REVISION HISTORY



UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 XX .010" FRACTIONS  
 X.XX .001" SCALE DRAWINGS

DATE: 2/17/2020  
 BY: cwarden  
 TITLE: ASSY, WIRED MOTOR, 2HP/460/3PH  
 DWG NO: 9538-0066A  
 REV: A

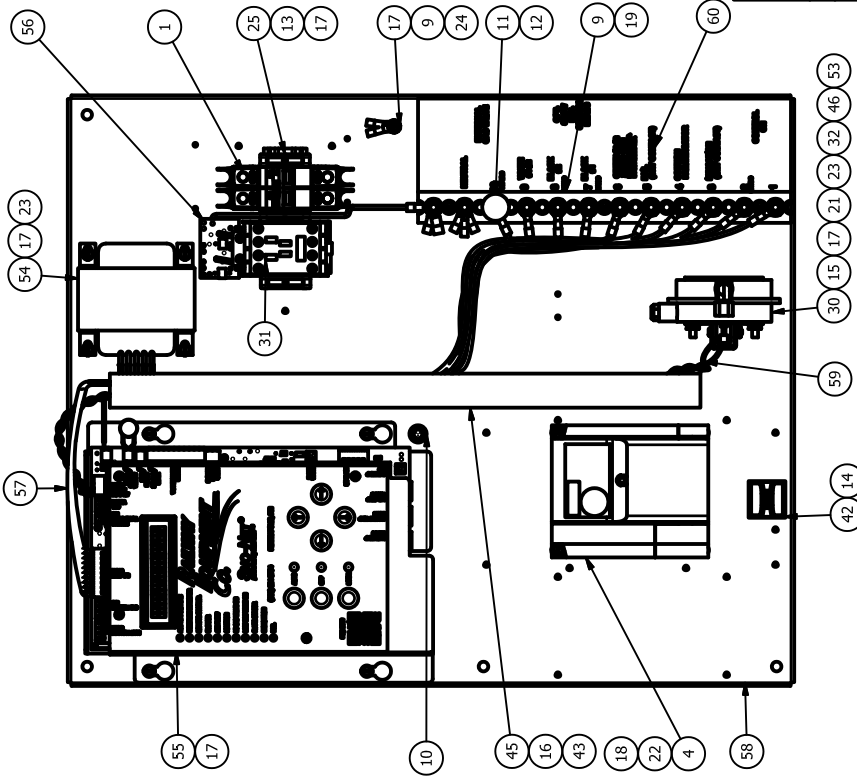
SCALE: 1/3 DRAWING: B SHEET 1 OF 1

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**RAILWAY EQUIPMENT CO.**  
 1000 W. 10th Street, Suite 100  
 Portland, OR 97201  
 (503) 251-1111

REV	ECO #	DESCRIPTION	DATE	BY
A	17-0016	NEW PART	12/11/2017	JT
B	18-0034	MODULE, HEATER	12/18/2018	JT
C	-	CHANGE AC DRIVE	3/6/2019	TB
D	-	CHANGED TO ALLEN BRADLEY/MITSUBISHI COMPONENTS	11/5/2019	AK

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
48	681205	-	21	IN	WIRE, 12 GA GREEN
49	681601	-	27.5	IN	WIRE, 16 GA GREEN HOOK UP
50	681832	-	62	IN	WIRE, 18 GA 300V 105C BLACK
51	681833	-	32	IN	WIRE, 18 GA, THINWALL WHITE 300V
52	681834	-	12	IN	WIRE, 18 GA THINWALL, RED, 300V
53	7600001200	-	1	EA	ENCLOSURE FOR SCREW TERM LRG SWITCH
54	9338-0015C	C	1	EA	TRANSFORMER, CONTROL MODULE
55	9338-0320P	P	1	EA	CONTROL MODULE, GHAB W / TC / WEB PAGE ENABLE
56	9338-0325B	B	1	EA	SURGE ARRESTOR ASSY, 240V 1PH
57	9508-0001A	A	1	EA	GHAB MODULE TO AAR HARNESS
58	95085D	D	1	EA	PANEL, GHAB CON WITH DISPLAY
59	9538-0029B	B	1	EA	ASSY, AIR FLOW WIRES HIGH IN PANEL
60	R9330-0021B	B	1	EA	LABEL, TERM POST SNO NET

ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	1300749600	-	1	EA	CIRCUIT BREAKER, 2 POLES 30 AMP 480 VOLT INDUCTIVE
2	14046	-	1	EA	BAG, 9 X 12 4MIL ZIPTOP
3	14172	-	1	EA	HEATER, PANEL HEATER 100W 120VAC NO THERMOSTAT 30" LEADS
4	2100166400	-	1	EA	DRIVE, AC, 2HP, 230V 1PH INPUT, 3PH OUTPUT
5	21020	-	1	EA	CONNECTOR, HOUSING, 2 POS
6	21021	-	1	EA	STRAIN RELIEF, 2 POS
7	21023	-	1	EA	STRAIN RELIEF, 3 POS
8	21212	-	1	EA	CONNECTOR, HOUSING, 3 POS 18GA
9	28029	-	1	EA	TERMINAL ASSY, 1 X 12 POS
10	28077	-	1	EA	GROMMET, .25 I.D., 9/16 O.D BLACK
11	28090	-	1	EA	CAP, TERMINAL POST INSULATING
12	28091	-	1	EA	SHIELD, TERMINAL POST INSULATE
13	28104	-	4.5	IN	DIN MOUNTING RAIL 35MM
14	2831211106	-	1	EA	SCREW, #6-32 X 3/8 PAN SLT
15	2831211116	-	2	EA	SCREW, #6-32 X 1 PAN SLT
16	2831311106	-	5	EA	SCREW, #8-32 X 3/8 PAN SLT
17	2831411106	-	13	EA	SCREW, #10-32 X 3/8 PAN SLT
18	2831411108	-	4	EA	SCREW, #10-32 X 1/2 PAN SLT
19	2831411110	-	3	EA	SCREW, #10-32 X 5/8 PAN SLT
20	2832-4301	-	2	EA	NUT, #10-32 KEPS
21	2832-6301	-	2	EA	NUT, #6-32 KEPS
22	2833-3110	-	4	EA	WASHER, #8 FLAT SAE
23	2833-4210	-	4	EA	WASHER, #10 SPLIT LOCK
24	2833-4310	-	2	EA	WASHER, #10 EXT. STAR
25	29104	-	3	EA	CLAMP, DIN MOUNT END
26	3100104000	-	6	EA	LUG, 18GA MALE FERRULE INSULATED
27	35205A	A	1	EA	BRACKET, PRESSURE SWITCH MOUNT FOR PANEL
28	51274	-	1	EA	FUSE HOLDER, INLINE 18 GA
29	51275	-	1	EA	FUSE, 2A MDA 250V
30	53096	-	1	EA	PRESSURE SWITCH
31	5400489800	-	1	EA	CONTACTOR, 4POLE 32 AMP 115V COIL 9 AMP INDUCTIVE
32	60167	-	1	EA	FITTING, 90o MALE BRASS
33	60223	-	10	IN	HEATSHRINK, TUBING 3/16 BLACK
34	6032-0111	-	3	EA	LUG, RING #10 16-14GA NYLON
35	6032-0116	-	3	EA	LUG, RING #10 12-10GA VINYL
36	6032-0117	-	1	EA	LUG, RING 1/4 12-10GA VINYL
37	6032-0118	-	3	EA	LUG, RING 1/4 16-14GA VINYL
38	6032-0119	-	1	EA	LUG, RING #10 22-18GA VINYL
39	6032-0120	-	1	EA	LUG, RING 1/4 22-18GA VINYL
40	6032-0123	-	1	EA	LUG, BUTT CONNECTOR 20-18 GA W/HEAT SHRINK SEAL
41	6034-0111	-	1	EA	LUG, PUSH-ON F. 250 22-18GA
42	6090-0102	-	1	EA	CABLE TIE MOUNTS
43	6093-0003	-	19	IN	WIRE DUCT, 1IN W 3IN H
44	6093-0100	-	15	EA	CABLE TIE, 4IN 0.10 WIDTH
45	6093-0302	-	19	IN	WIRE DUCT, COVER 1 IN
46	61090	-	1	EA	MUFFLER / FILTER, 1/8" NPT, 7/16" DIA.
47	681001	-	87	IN	WIRE, 10 GA BLACK 600V 105C



PARTS LIST

PARTS LIST

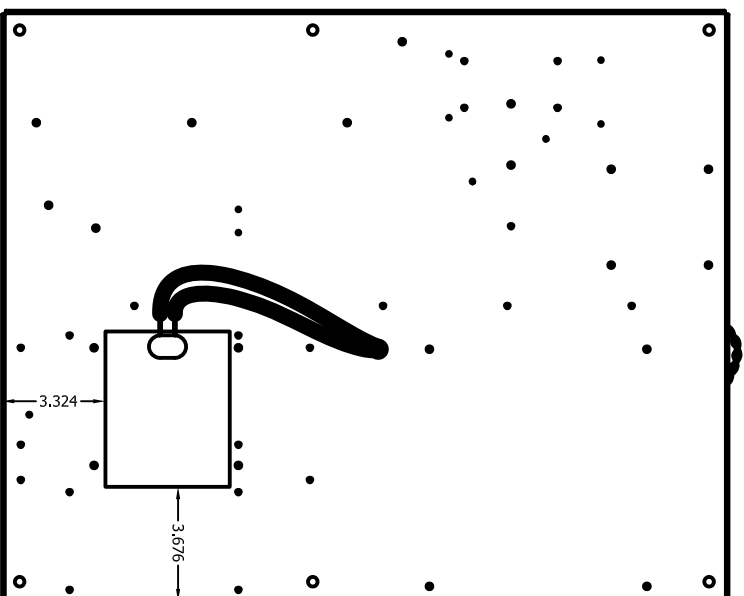
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 DECIMALS TO 3 PLACES  
 FRACTIONS TO 16THS  
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DATE: 3/16/2020  
 DRAWN BY: akollman  
 PART NAME: 9508-0154D  
 PART NUMBER: 9508-0154D  
 SCALE: 1:1  
 SHEET: 1 OF 4

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**RAILWAY EQUIPMENT CO.**  
 10000 W. 10TH AVE., DENVER, CO 80201  
 (303) 455-3000

TITLE: ASSY, GHAB CONTROL PANEL 2HP 230V AC DRIVE

# REAR VIEW



NOTE: PLACE HEATER PAD IN A LOCATION THAT DOES NOT  
BLOCK THE MOUNTING HOLES FOR THE AC DRIVE

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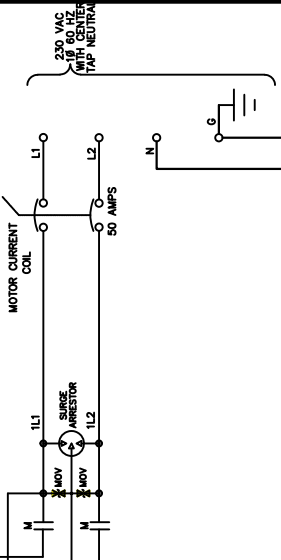
**RAILWAY EQUIPMENT CO.**  
INDUSTRIAL PARK, BIRMINGHAM AL 35202  
(205) 998-4000

UNLESS OTHERWISE SPECIFIED:		DIMENSIONS ARE IN INCHES	
DECIMALS	FRACTIONS	DECIMALS	FRACTIONS
XX	1/16	XX	1/16
XXX	1/32	XXX	1/32
XXXX	1/64	XXXX	1/64
DRAWN BY: skollman		DATE: 3/16/2020	
CHECKED BY: skollman		DATE: 3/16/2020	
MATERIAL: NA		DIVISION: 9508-0154D	
REVISIONS: NA		SCALE: 1:4	
		SHEET 2 OF 4	
		REV: D	
TITLE: ASSY, GHAB CONTROL PANEL 2HP 230V AC DRIVE			

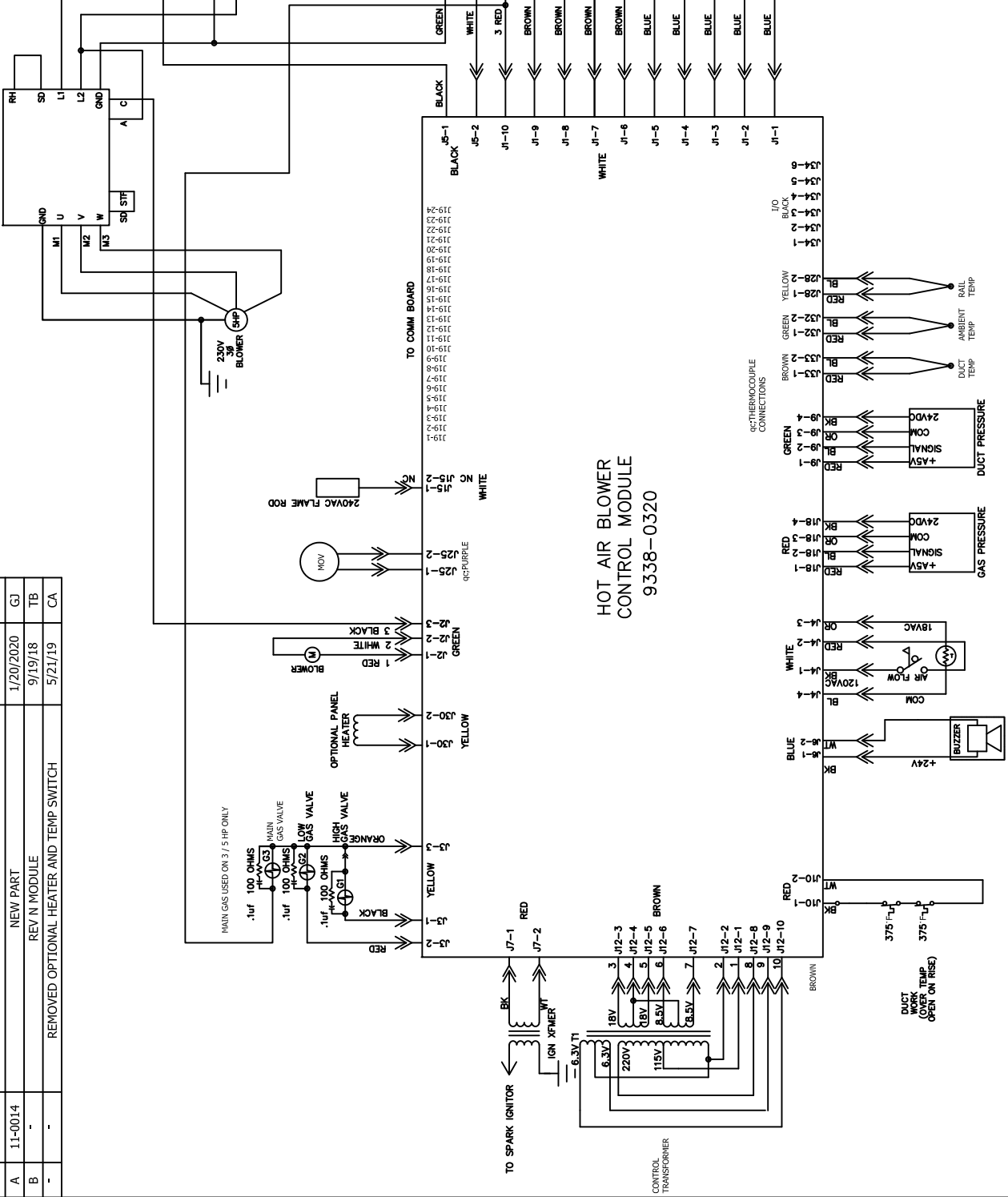
# MITSUBISHI DRIVE

NOTE:  
MITSUBISHI DRIVE SETTINGS:

- P1 = 60 MAX HZ
- P2 = 55 MIN HZ
- P3 = 60 MOTOR BASE HZ
- P4 = 60 HZ RUNNING SPEED FOR 2HP AND 3HP, 58HZ FOR 5 HP
- P7 = 20 SECOND RAMP
- P9 = MOTOR OVERLOAD CURRENT 2HP=6, 3HP=8.7, 5HP=13.5
- P77 = 2 CHANGE PARAMETERS WHILE RUNNING
- P79 = 3 EXTERNAL/PU
- P192 = 0 RELAY INDICATION INVERTER RUNNING
- P872 = 0 FOR 5HP ONLY



REV	ECO #	DESCRIPTION	DATE	BY
A	11-0014	NEW PART	1/20/2020	GJ
B	-	REV N MODULE	9/19/18	TB
-	-	REMOVED OPTIONAL HEATER AND TEMP SWITCH	5/21/19	CA



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 RAILWAY EQUIPMENT, MANUFACTURER

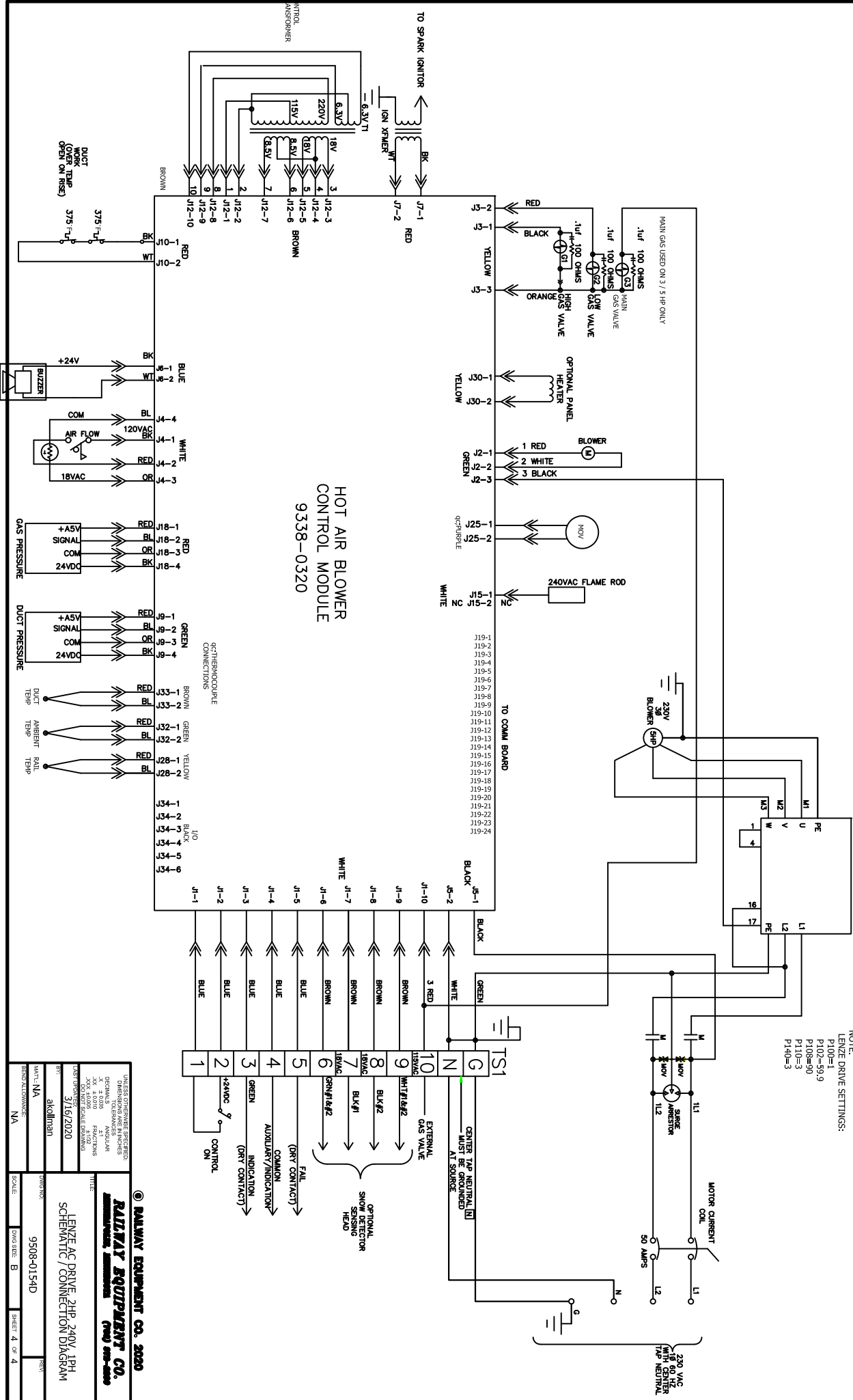
UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS TO THIRDS  
 FRACTIONS XX/1000  
 XX = 1010  
 XX = 1020 NOT SCALE DRAWING  
 DATE: 3/16/2020  
 DRAWN BY: akollman  
 CHECKED BY: NA  
 SCALE: 9508-0154D  
 SHEET 3 OF 4

MITSUBISHI AC DRIVE, 2HP, 240V, 1PH  
 SCHEMATIC / CONNECTION DIAGRAM

# LENZE DRIVE

NOTE:  
LENZE DRIVE SETTINGS:

- P100=1
- P102=59.9
- P108=90
- P110=3
- P140=3



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS		TITLE <b>LENZE AC DRIVE 2HP 240V 1PH SCHEMATIC / CONNECTION DIAGRAM</b>	
DATE 3/16/2020	BY akollman	DESIGNED BY akollman	DRAWN BY akollman
REV 1	DESCRIPTION REVISED FOR 2HP 240V 1PH	DATE 3/16/2020	BY akollman
APP'D NA	DATE NA	SCALE AS SHOWN	SHEET 4 OF 4

**RAILWAY EQUIPMENT CO. 2020**  
RAILWAY EQUIPMENT CO.  
1000 W. 10th St. #100  
Bismarck, ND 58501  
(701) 759-2000

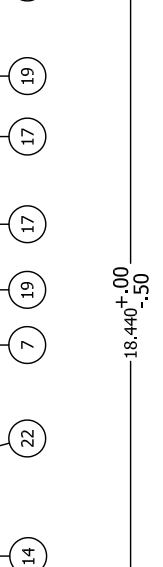
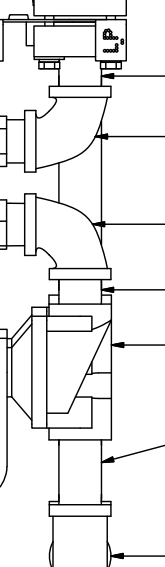
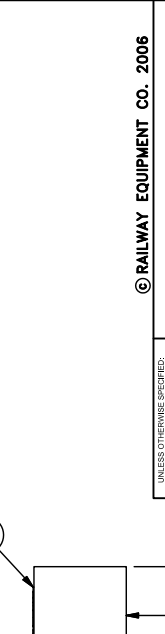
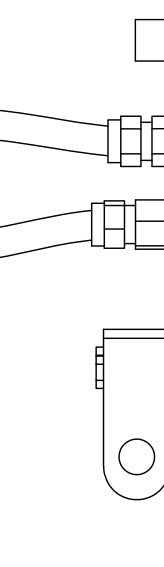
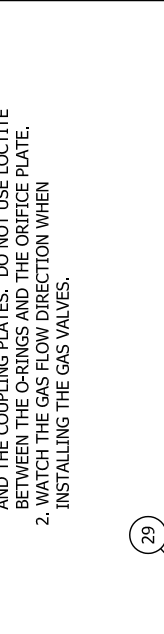
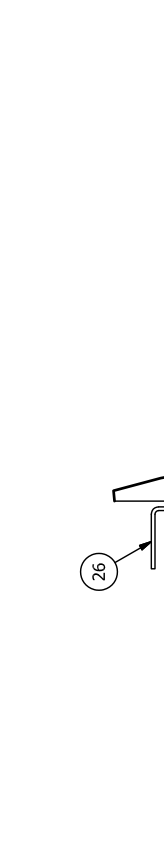
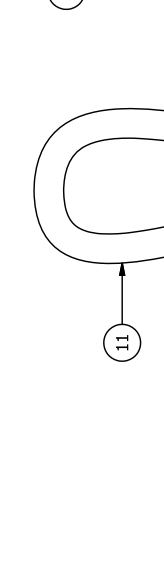
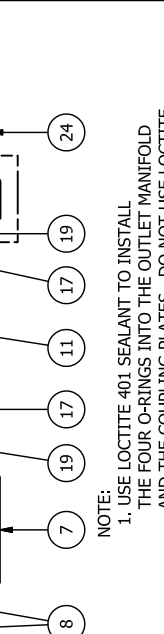
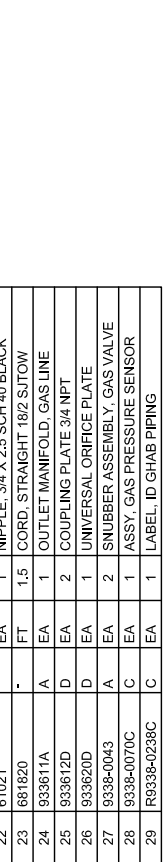
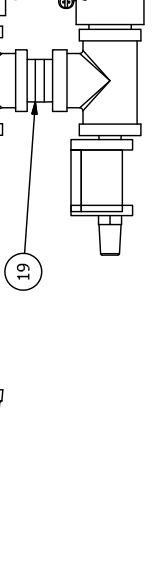
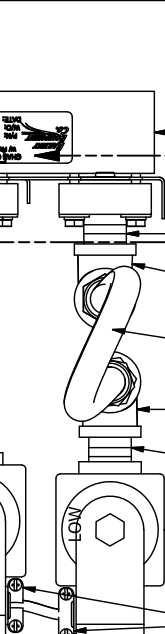
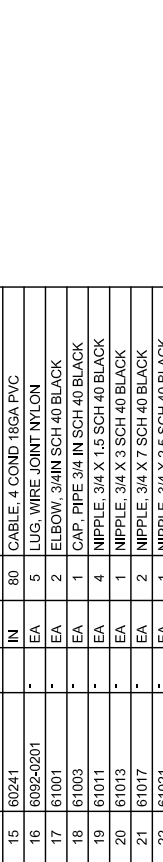
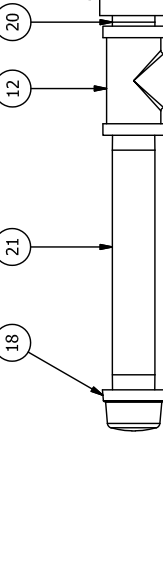
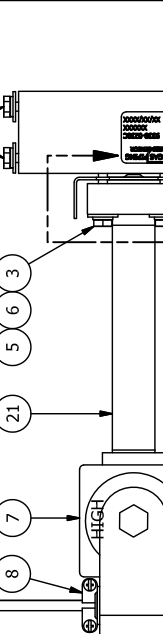
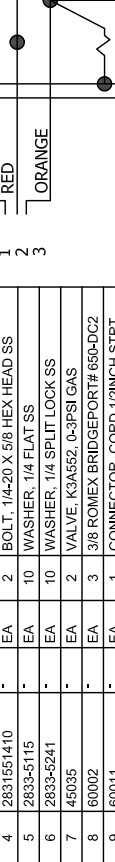


REV	ECO	DESCRIPTION	DATE	BY
A	06-0008	NEW PART W/ PRESSURE SENSOR	6/23/2006	RMJ
B	07-0016	CHANGED CONDUIT TO CORD	6/5/2007	RMJ
C	09-0012	MOVED COVER AND BRACKET TO GHAB ASSEMBLY	8/28/09	ES

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	21023	-	EA	1	STRAIN RELIEF, 3 POS
2	21212	-	EA	1	CONNECTOR, HOUSING, 3 POS 18GA
3	2831551134	-	EA	8	BOLT, 1/4-20 X 1-3/4 HEXTAP SS
4	2831551410	-	EA	2	BOLT, 1/4-20 X 5/8 HEX HEAD SS
5	2833-5115	-	EA	10	WASHER, 1/4 FLAT SS
6	2833-5241	-	EA	10	WASHER, 1/4 FLAT SS
7	45035	-	EA	2	VALVE, K3A552, 0-3PSI GAS
8	60002	-	EA	3	3/8 ROMEX BRIDGEPORT# 650-DC2
9	60011	-	EA	1	CONNECTOR, CORD 1/2INCH STRT
10	60160	-	EA	1	CONDUIT, LOCK NUT 1/2 IN
11	60197	-	EA	1	FLEX HOSE 3/4 X 18 - 5/8 OD
12	60225	-	EA	1	TEE, 3/4 X 3/4 X 3/4 SCH 40
13	60231	-	EA	4	O-RING, BUNA-N, 3/16 WIDE
14	60234	-	EA	1	TEE, 3/4 X 3/4 X 1/4 SCH 40 BLK
15	60241	-	IN	80	CABLE, 4 COND 18GA PVC
16	6092-0201	-	EA	5	LUG, WIRE JOINT NYLON
17	61001	-	EA	2	ELBOW, 3/4IN SCH 40 BLACK
18	61003	-	EA	1	CAP, PIPE 3/4 IN SCH 40 BLACK
19	61011	-	EA	4	NIPPLE, 3/4 X 1.5 SCH 40 BLACK
20	61013	-	EA	1	NIPPLE, 3/4 X 3 SCH 40 BLACK
21	61017	-	EA	2	NIPPLE, 3/4 X 7 SCH 40 BLACK
22	61021	-	EA	1	NIPPLE, 3/4 X 2.5 SCH 40 BLACK
23	681820	-	FT	1.5	CORD, STRAIGHT 18/2 SJTOW
24	933611A	A	EA	1	OUTLET MANIFOLD, GAS LINE
25	933612D	D	EA	2	COUPLING PLATE 3/4 NPT
26	933620D	D	EA	1	UNIVERSAL ORIFICE PLATE
27	9338-0043	A	EA	2	SNUBBER ASSEMBLY, GAS VALVE
28	9338-0070C	C	EA	1	ASSY, GAS PRESSURE SENSOR
29	R9338-0238C	C	EA	1	LABEL, ID GHAB PIPING

REV	ECO	DESCRIPTION	DATE	BY
A	06-0008	NEW PART W/ PRESSURE SENSOR	6/23/2006	RMJ
B	07-0016	CHANGED CONDUIT TO CORD	6/5/2007	RMJ
C	09-0012	MOVED COVER AND BRACKET TO GHAB ASSEMBLY	8/28/09	ES

ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	21023	-	EA	1	STRAIN RELIEF, 3 POS
2	21212	-	EA	1	CONNECTOR, HOUSING, 3 POS 18GA
3	2831551134	-	EA	8	BOLT, 1/4-20 X 1-3/4 HEXTAP SS
4	2831551410	-	EA	2	BOLT, 1/4-20 X 5/8 HEX HEAD SS
5	2833-5115	-	EA	10	WASHER, 1/4 FLAT SS
6	2833-5241	-	EA	10	WASHER, 1/4 FLAT SS
7	45035	-	EA	2	VALVE, K3A552, 0-3PSI GAS
8	60002	-	EA	3	3/8 ROMEX BRIDGEPORT# 650-DC2
9	60011	-	EA	1	CONNECTOR, CORD 1/2INCH STRT
10	60160	-	EA	1	CONDUIT, LOCK NUT 1/2 IN
11	60197	-	EA	1	FLEX HOSE 3/4 X 18 - 5/8 OD
12	60225	-	EA	1	TEE, 3/4 X 3/4 X 3/4 SCH 40
13	60231	-	EA	4	O-RING, BUNA-N, 3/16 WIDE
14	60234	-	EA	1	TEE, 3/4 X 3/4 X 1/4 SCH 40 BLK
15	60241	-	IN	80	CABLE, 4 COND 18GA PVC
16	6092-0201	-	EA	5	LUG, WIRE JOINT NYLON
17	61001	-	EA	2	ELBOW, 3/4IN SCH 40 BLACK
18	61003	-	EA	1	CAP, PIPE 3/4 IN SCH 40 BLACK
19	61011	-	EA	4	NIPPLE, 3/4 X 1.5 SCH 40 BLACK
20	61013	-	EA	1	NIPPLE, 3/4 X 3 SCH 40 BLACK
21	61017	-	EA	2	NIPPLE, 3/4 X 7 SCH 40 BLACK
22	61021	-	EA	1	NIPPLE, 3/4 X 2.5 SCH 40 BLACK
23	681820	-	FT	1.5	CORD, STRAIGHT 18/2 SJTOW
24	933611A	A	EA	1	OUTLET MANIFOLD, GAS LINE
25	933612D	D	EA	2	COUPLING PLATE 3/4 NPT
26	933620D	D	EA	1	UNIVERSAL ORIFICE PLATE
27	9338-0043	A	EA	2	SNUBBER ASSEMBLY, GAS VALVE
28	9338-0070C	C	EA	1	ASSY, GAS PRESSURE SENSOR
29	R9338-0238C	C	EA	1	LABEL, ID GHAB PIPING



NOTE:  
 1. USE LOCTITE 401 SEALANT TO INSTALL THE FOUR O-RINGS INTO THE OUTLET MANIFOLD AND THE COUPLING PLATES. DO NOT USE LOCTITE BETWEEN THE O-RINGS AND THE ORIFICE PLATE.  
 2. WATCH THE GAS FLOW DIRECTION WHEN INSTALLING THE GAS VALVES.

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RAILWAY EQUIPMENT CO.  
 DELAWARE, MINNESOTA (763) 876-2800

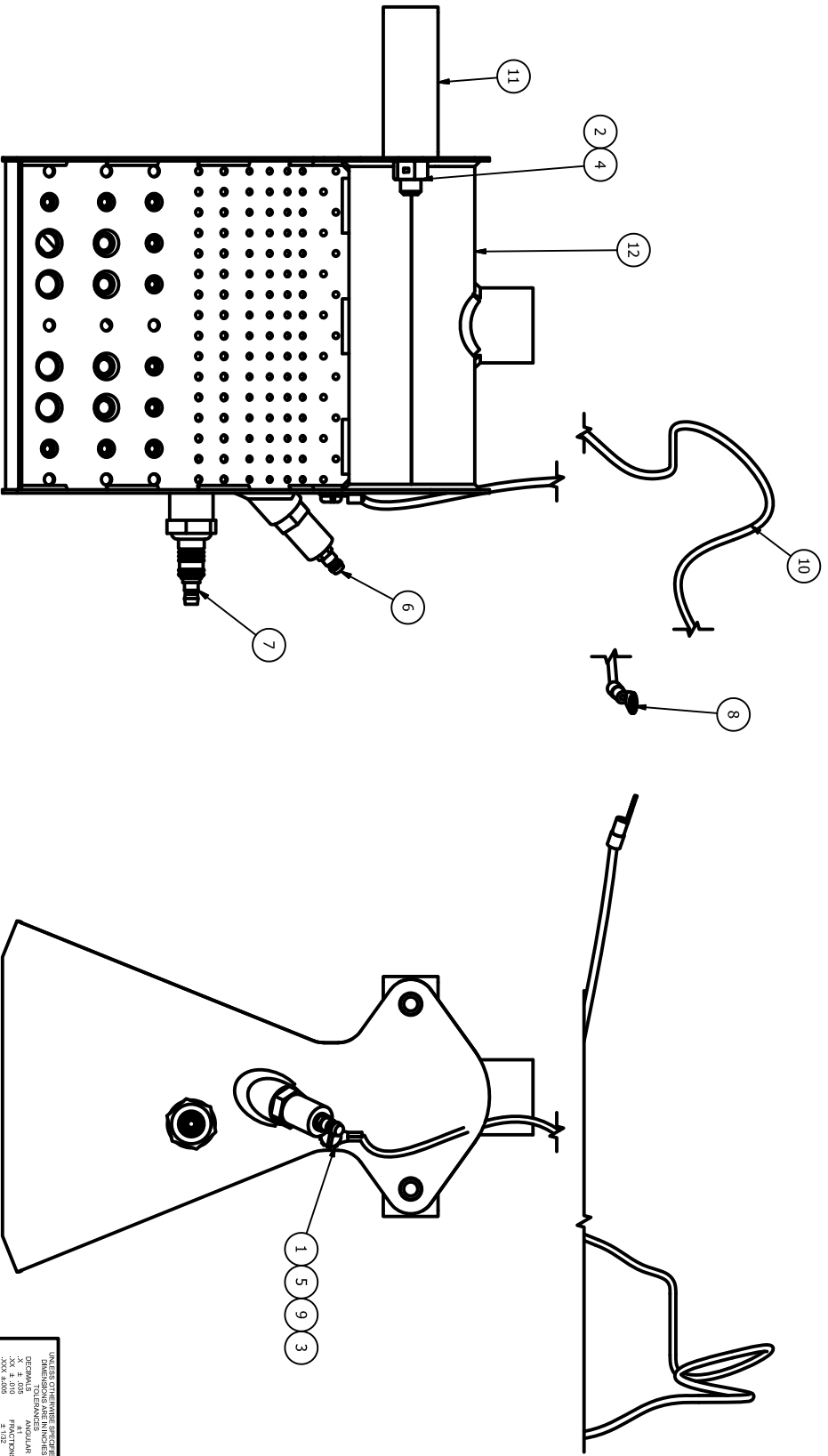
TITLE: GHAB GAS PIPING W/ PRESS SENSOR  
 2HP GHAB HIGH PROFILE

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS - FRACTIONS .XX - 0.02" FRACTIONS DO NOT SCALE DRAWINGS	DATE: 3/20/2019	DWG NO: 9338-0238C	REV: C
DRAWN: TBERTOLDI	SCALE: 1/3	DESIGNER: B	SHEET 1 OF 1
DATE: 3/20/2019	SCALE: 1/3	DESIGNER: B	SHEET 1 OF 1
DATE: 3/20/2019	SCALE: 1/3	DESIGNER: B	SHEET 1 OF 1

DETAIL D  
 SCALE 1 / 2

PARTS LIST				PARTS LIST							
ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION	ITEM	PART NUMBER	REV	QTY	UOM	DESCRIPTION
1	2831411408	-	1	EA	SCREW, #10-32 X 1/2 PAN SLT SS	7	56071	A	1	EA	SPARK IGNITOR, 6 INCH BURNER
2	2831851112	-	2	EA	BOLT, 3/8-16 X 3/4 HEX HEAD	8	6032-0118	-	1	EA	LUIG, RING 1/4 16-14GA VINYL
3	2832-4201	-	1	EA	NUIT, #10-32 HEX SS	9	6033-0100	-	1	EA	LUIG, RING #10 16-14GA HI-TEMP
4	2832-8904	-	2	EA	NUIT, 3/8-16 CENTERLOCK	10	681402	-	2	FT	WIRE, 14GA HIGH TEMP
5	2833-4310	-	2	EA	WASHER, #10 EXT. STAR	11	950103	A	1	EA	SUPPORT BRKT, 6 IN BURNER
6	53070	-	1	EA	FLAME SENSOR, 7.5"	12	950140C	C	1	EA	BURNER WELDMENT, 6 INCH SS

REVISION HISTORY				
REV	ECO #	DESCRIPTION / PRINT UPDATE	DATE	BY
C	02-0004	NEW BURNER / PRINT UPDATE	06/21/05	RF



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**RAILWAY EQUIPMENT CO.**  
 1000 W. 10th Street, Lawrence, KS 66044  
 (785) 846-2200

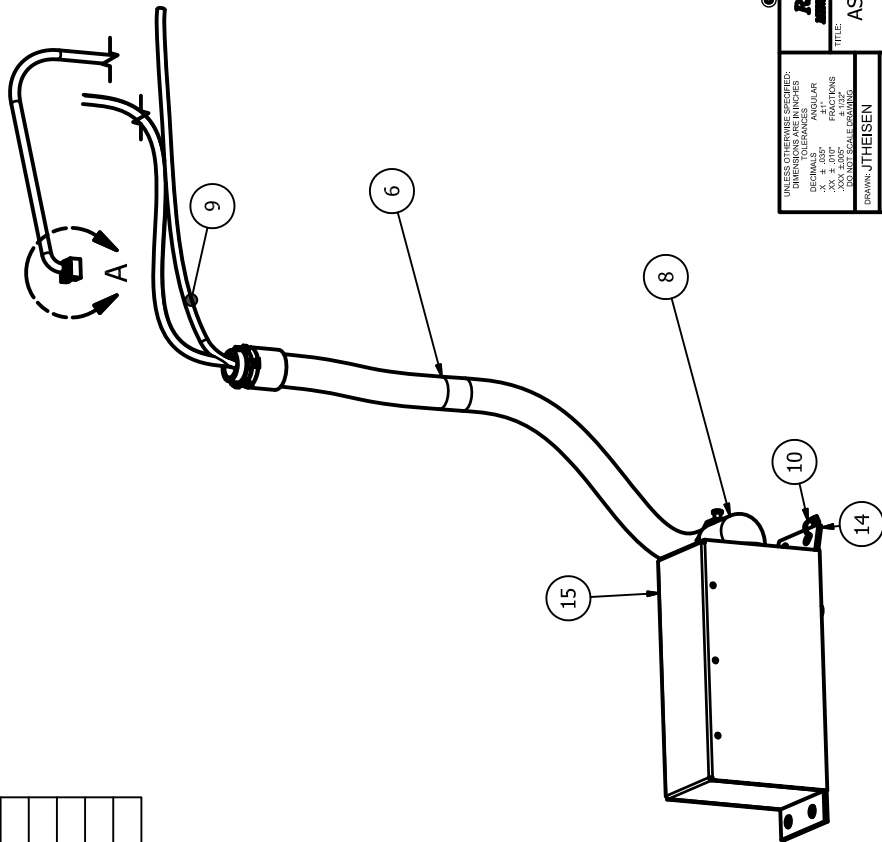
UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS ANGULAR  
 .XX 4 1/16 FRACTIONS  
 .XXX 1/32 ROUND SOLE DIMENSIONS

DRAWN: JTHEISEN  
 DATE: 5/12/2017  
 WNT:  
 REVISION ALLOWANCE:

TITLE: BURNER, 6" VERTICAL  
 DRAWING NO: 9508-0135C  
 SCALE: 1/2" = 1"  
 DIMENSIONS: B  
 SHEET 1 OF 1

REVISION HISTORY				
REV	ECO #	DESCRIPTION	DATE	BY
A	17-0016	NEW PART	11/22/2017	JT

PARTS LIST					
ITEM	PART NUMBER	REV	UOM	QTY	DESCRIPTION
1	16003	-	EA	.05	RTV SILICONE CLEAR 10 OZ TUBE
2	1660000200	-	EA	1	FITTING, COMPRESSION 1/4" OD AIRLINE TO NPT 1/4" BRASS
3	1660000300	-	EA	1	FITTING, 1/4" NPT RIGHT ANGLE TEE FM BRASS
4	2831411429	-	EA	2	SCREW, #10-32 X 1-3/4 PAN PHIL SS
5	60037	-	EA	2	BUSHING,ANTI-SHORT 3/4 IN FLEX
6	60061	-	FT	2	CONDUIT, FLEX 3/4 INCH STEEL
7	60071	-	EA	1	CONDUIT, FLEX CONNECTOR STRT
8	60093	-	EA	1	CONDUIT, FLEX CONNECTOR 90
9	60168	-	IN	70	TUBE, 1/4 IN OD CLEAR VINYL TUBING
10	6093-0100	-	EA	2	CABLE TIE, 4IN 0.10 WIDTH
11	61069	-	EA	1	MUFFLER / FILTER 1/4" BRASS
12	9338-0073A	A	EA	1	ASSY, DUCT PRESSURE SENSOR
13	9508-0085A	A	EA	1	ASSY, DUCT SENSOR EXT CABLE
14	950828A	A	EA	1	PLATE, PRESSURE SENSOR 2HP
15	950829A	A	EA	1	COVER, PRESSURE SENSOR 2 HP
16	R9508-0146A	A	EA	1	LABEL, ID



DETAIL A  
SCALE 3 / 4

UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
DECIMALS - TYPICAL  
.XX, .X, .010" FRACTIONS  
XXX, XX, X, .0001" SCALE DRAWINGS

TITLE: ASSY, 2HP PRESSURE SWITCH WITH PRESSURE SENSOR

DRAWN: JTHEISEN

DATE: 1/25/2019

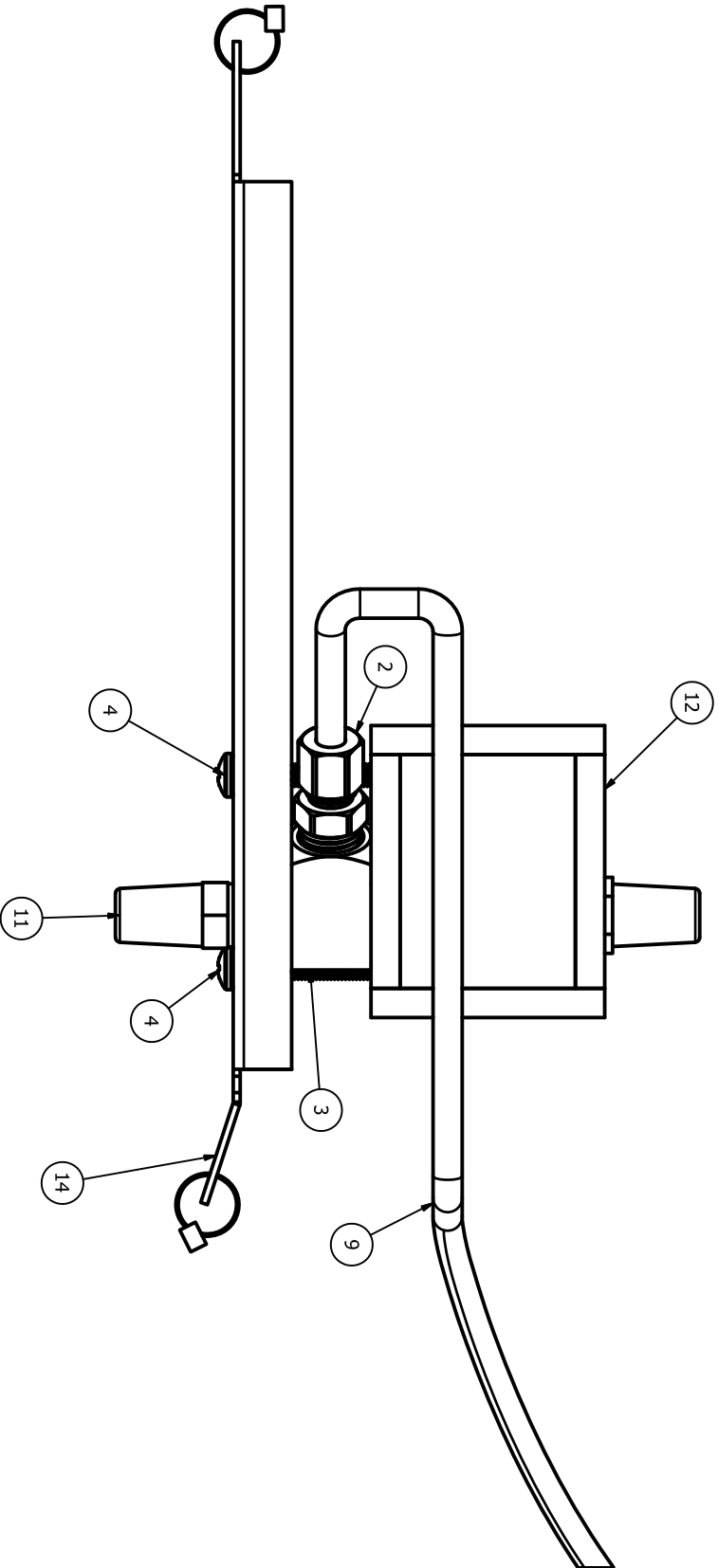
SCALE: N/A

REV: A

9508-0146A

SHEET 1 OF 2

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INDIANAPOLIS, INDIANA (317) 897-8899



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**RAILWAY EQUIPMENT CO.**  
 1000 W. 10th St. #100  
 Denver, CO 80202 (303) 555-5555

TITLE: **ASSY, 2HP PRESSURE SWITCH WITH PRESSURE SENSOR**

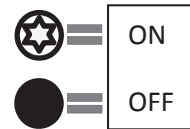
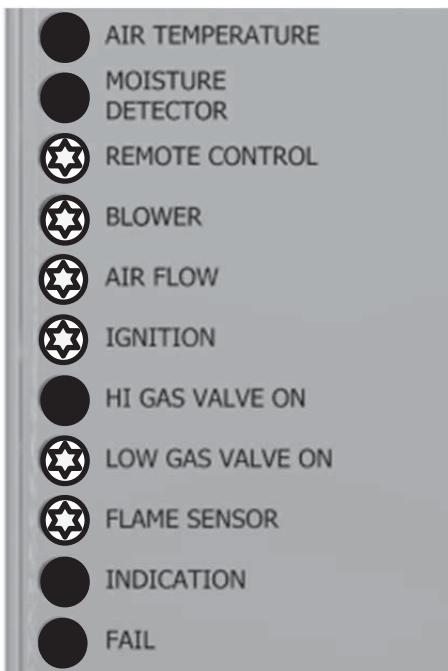
UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 DECIMALS .0001 ANGULAR  
 .XX .4 .010" FRACTIONS  
 .XX .0001 .0001  
 DRAWN: TBERTOLDI  
 DATE: 5/19/2018

DWG NO: **9508-0146A** REV: **A**  
 UNIT: **IN**  
 BEND/TOLERANCE: **B** SCALE: **1"=1"** SHEET **2** OF **2**

## Pressure Switch Calibration

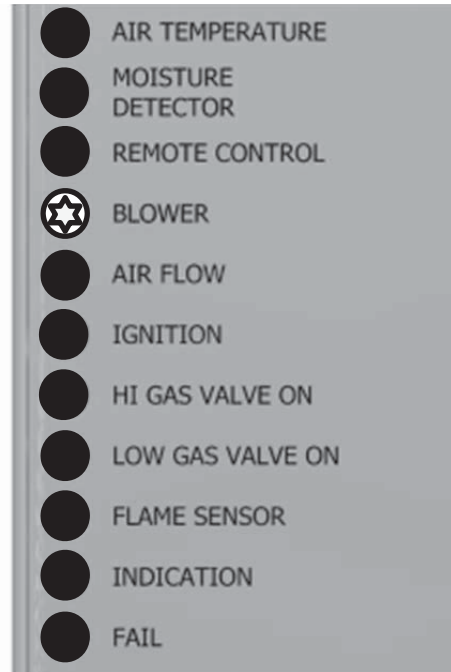
These steps describe how to calibrate the pressure switch to turn off when 90% of the air intake is blocked.

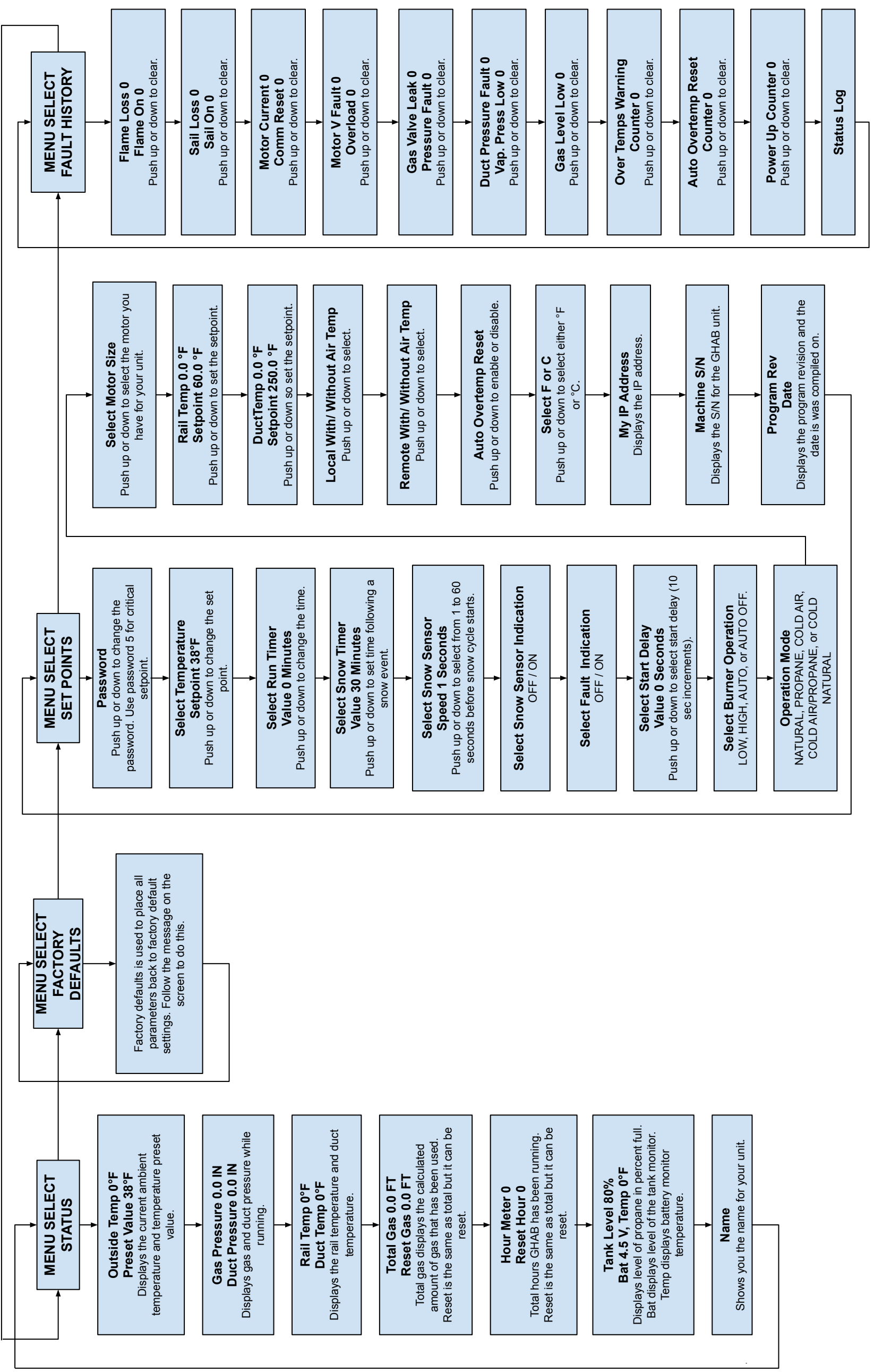
1. The Pressure Switch comes pre-calibrated based on the horsepower of the Gas Hot Air Blower. If adjustment is needed they can be adjusted between 0.12"wc to 5.0"wc. Turning the adjustment screw on the pressure switch has these effects to the pressure set point:
  - a. Clockwise (CW) = increase pressure set point
  - b. Counterclockwise = decrease pressure set point
2. Run the GHAB in a normal manner such that air flow and flame are present. If air flow cannot be proven, turn the Pressure Switch adjustment screw Counter Clockwise (CCW) until the air flow LED turns on.



3. Block the air intake 90% with cardboard. The suction from the GHAB will hold the cardboard in place.

4. Turn the Pressure Switch adjustment screw Clockwise (CW) until the Air Flow LED on the control module turns off. It is now calibrated.





**MENU SELECT STATUS**

**Outside Temp 0°F  
Preset Value 38°F**  
Displays the current ambient temperature and temperature preset value.

**Gas Pressure 0.0 IN  
Duct Pressure 0.0 IN**  
Displays gas and duct pressure while running.

**Rail Temp 0°F  
Duct Temp 0°F**  
Displays the rail temperature and duct temperature.

**Total Gas 0.0 FT  
Reset Gas 0.0 FT**  
Total gas displays the calculated amount of gas that has been used. Reset is the same as total but it can be reset.

**Hour Meter 0  
Reset Hour 0**  
Total hours GHAB has been running. Reset is the same as total but it can be reset.

**Tank Level 80%  
Bat 4.5 V, Temp 0°F**  
Displays level of propane in percent full. Bat displays level of the tank monitor. Temp displays battery monitor temperature.

**Name**  
Shows you the name for your unit.

**MENU SELECT FACTORY DEFAULTS**

Factory defaults is used to place all parameters back to factory default settings. Follow the message on the screen to do this.

**MENU SELECT SET POINTS**

**Password**  
Push up or down to change the password. Use password 5 for critical setpoint.

**Select Temperature Setpoint 38°F**  
Push up or down to change the set point.

**Select Run Timer Value 0 Minutes**  
Push up or down to change the time.

**Select Snow Timer Value 30 Minutes**  
Push up or down to set time following a snow event.

**Select Snow Sensor Speed 1 Seconds**  
Push up or down to select from 1 to 60 seconds before snow cycle starts.

**Select Snow Sensor Indication OFF / ON**

**Select Fault Indication OFF / ON**

**Select Start Delay Value 0 Seconds**  
Push up or down to select start delay (10 sec increments).

**Select Burner Operation LOW, HIGH, AUTO, or AUTO OFF.**

**Operation Mode NATURAL, PROPANE, COLD AIR, COLD AIR/PROPANE, or COLD NATURAL**

**MENU SELECT FAULT HISTORY**

**Flame Loss 0  
Flame On 0**  
Push up or down to clear.

**Sail Loss 0  
Sail On 0**  
Push up or down to clear.

**Motor Current 0  
Comm Reset 0**  
Push up or down to clear.

**Motor V Fault 0  
Overload 0**  
Push up or down to clear.

**Gas Valve Leak 0  
Pressure Fault 0**  
Push up or down to clear.

**Duct Pressure Fault 0  
Vap. Press Low 0**  
Push up or down to clear.

**Gas Level Low 0**  
Push up or down to clear.

**Over Temps Warning Counter 0**  
Push up or down to clear.

**Auto Overtemp Reset Counter 0**  
Push up or down to clear.

**Power Up Counter 0**  
Push up or down to clear.

**Status Log**

**Select Motor Size**  
Push up or down to select the motor you have for your unit.

**Rail Temp 0.0 °F  
Setpoint 60.0 °F**  
Push up or down to set the setpoint.

**DuctTemp 0.0 °F  
Setpoint 250.0 °F**  
Push up or down so set the setpoint.

**Local With/ Without Air Temp**  
Push up or down to select.

**Remote With/ Without Air Temp**  
Push up or down to select.

**Auto Overtemp Reset**  
Push up or down to enable or disable.

**Select F or C**  
Push up or down to select either °F or °C.

**My IP Address**  
Displays the IP address.

**Machine S/N**  
Displays the S/N for the GHAB unit.

**Program Rev Date**  
Displays the program revision and the date is was compiled on.